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Evaluating a Managed Learning Environment in a UK Higher Education Institution; a stakeholder approach

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For my courageous, inspirational, precious Mum
Eileen Quinn
1944 - 2009

Abstract

Managed Learning Environments (MLE) in Higher Education Institutions (HEIs), as a concept, are relatively new to the arena of Higher Education; nevertheless over 90% of institutions in the Higher and Further Education sector have been engaged in some kind of MLE development activity (University of Brighton, 2005). However, this increased use of learning technology has not produced a concomitant rise in appropriate forms of evaluation (Tricker et al., 2001; Bullock & Ory, 2000). There are no universally recognisable frameworks for evaluating MLEs in HEIs currently discussed within the literature.

A review of the literature highlighted the importance of stakeholder involvements in the evaluation process. It was found that an appropriate framework for evaluation needs to be able to: capture the locally situated version of an MLE; cope with the complexity of a system with an unspecified number of variables; identify and encompass stakeholder needs; and understand why certain phenomena has been observed.

Soft Systems Methodology (SSM) was considered to be an appropriate framework to cope with all these issues. It uses systems thinking as its theoretical base and one of the major strengths, from the point of view of this research, is its ability to cope explicitly with differing stakeholder views via the concept of *Weltanschauung* - the 'world-view' of different social actors (Rose & Haynes, 1999).

This longitudinal study was conducted using a dual-cycle (McKay & Marshall, 2001) Action Research approach. The host university was Manchester Metropolitan University who, at the start of this research project, began a phased implementation of an MLE. An evaluation model (Rose & Haynes, 1999) was used which was adjusted to allow for a stakeholder analysis to drive the evaluation criteria.

This study found SSM fulfilled the requirements of evaluation and so was considered a suitable approach. The study did however conclude that by contextualising SSM to the evaluation requirements of an MLE in a UK HEI, the measures of performance suggested by SSM may need to be adjusted. Four out of the five measures of performance were found to adequately provide the evaluation criteria. Ethicality was the only measure of performance found to not be considered as an explicit measure of the information system under study.

Identification of stakeholders and encompassing their needs within evaluations were seen as key. This study found that a stakeholder classification framework, offered by Farbey et al. (1993), proved suitable in identifying relevant stakeholders to an MLE. It established that the framework facilitated a holistic representation of the key stakeholders and their views on key metrics on which to evaluate the MLE in situ.

This research was also interested in the process of evaluation. The processes utilised were adapted and adjusted over time and a number of key elements are proposed in order to gain efficiencies in resource requirements throughout the evaluation process.

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List of Abbreviations

AR	Action Research
BECTA	British Educational Communications and Technology Agency
FE	Further Education
HE	Higher Education
HEI	Higher Education Institution
IS	Information System
JISC	Joint Information Systems Council
LMS	Learning Management Systems
MLE	Managed Learning Environment
MMU	Manchester Metropolitan University
MS	Management Science
MSM	Management Science Methodology
OR	Operational Research
SCA	Strategic Choice Analysis
SRS	Student Record System
SODA	Strategic Option Decision Analysis
SSM	Soft Systems Methodology
UCISA	University and Colleges Information Systems Association
VLE	Virtual Learning Environment

Chapter 1: INTRODUCTION

1.1 CHAPTER SUMMARY

This chapter outlines the research project and identifies its importance to Higher Education Institutions (HEIs). In order to ensure a shared understanding between author and reader, this chapter establishes the concept of a Managed Learning Environment (MLE) and describes the widely varying implementations of this concept used within HEIs in the United Kingdom (UK). MLEs are little understood (Browne et al., 2008) both inside and outside the realms of higher education (HE) and so the vagaries of a system such as this needs to be made explicit. The chapter also introduces the subject of evaluating MLEs. An exhaustive review of relevant literature reveals design aspirations of increased student satisfaction and success through technology and finds interest in, but no framework for, evaluating MLEs. The investment required of HEIs, in terms of time and money, to develop effective MLEs, increases the importance of this research to institutions in the UK especially when university expenditure faces unprecedented scrutiny. This study and its findings are therefore offered as a timely contribution to institutions seeking to understand the effectiveness of their efforts to create a structured online environment for learners.

The chapter concludes by laying out the scope of the research project along with a plan of the thesis to assist the reader in gaining an understanding of thesis development.

1.2 LEARNING ENVIRONMENTS IN HIGHER EDUCATION

1.2.1 The Rise of Learning Environments in Higher Education

Whilst online learning environments can be traced back before the 1990s, it was in the middle of this decade that a consensus view of a Virtual Learning Environment (VLE) truly emerged (Stiles, 2007). Emergent systems at the time included mainstream proprietary systems, such as WebCT and Lotus Learningspace, and bespoke systems, such as those developed at the

universities of Leeds (Boddington), Bangor (Colloquia) and Stafford (COSE) (Stiles, 2007).

The notion of the Managed Learning Environment within the UK was first conceived by the JISC[1] (Joint Information Systems Committee) at a series of organised events in Manchester and London in 1999 (JISC infoNet, 2006). At these events, the term MLE appeared in the event titles for the first time and the concept of whole institutional systems began to be explored (JISC infoNet, 2006). JISC were at the forefront of UK developments within the MLE field pursuing interoperability between traditionally disparate software such as the Virtual Learning Environment, student records, library and timetabling systems (JISC infoNet, 2006).

In the early 2000s, the term 'MLE' was rarely, if ever, used in a UK HEI, although there was a general basic understanding of the concept of what an MLE actually was (University of Brighton, 2003). In academic research terms, the earliest journal based literature available using the term MLE was around 2002 (for example, Conole, 2002).

Early examples of the types of projects that were undertaken can be found in Table 1-1.

[1] JISC are a UK based organisation that supports the use of technology within UK Further (FE) and Higher (HE) Education. They comprise senior managers, academics and technical experts and are a strategic advisory committee working on behalf of the funding bodies of HE and FE education in England, Scotland, Wales and Northern Ireland (Porter, 2002; JISC, 2011a).

Project name	Where?	Aim
CoMantle	University of Wales, Bangor	Interoperability between learning management systems and administrative systems, using open technical standards
Managed Learning Environment Project	De Montfort University	Integrate multiple learning resource and support tools into a single environment
SMILE (Sunderland Managed Interactive Learning Environment)	University of Sunderland	Create a single system for presentation of a variety of support services and act as a test case for application of MLEs in the HE environment
INSIDE (an Institutionally Secure Integrated Data Environment)	Universities of St Andrews and Durham	Produce a reference model of distributed information sharing between administrative units and academic departments
GIMIS (Generic Integrated Management Information Systems)	Writtle College	Establish methodologies for dissemination of MIS information throughout the college

Table 1-1: Examples of Building MLEs in HE Programme Projects, and Their Aims (BECTA, 2003)

These projects were principally interested in sharing / dissemination of data across the institution with interoperability or integration being key to the success of these projects. These perfectly encapsulate the notion of the capabilities of an MLE and were the starting point for these institutions on their path to MLE development.

1.2.2 What is a Managed Learning Environment?

Defining the concept of an MLE is beset with difficulty. Significantly different versions of the meaning of an MLE are available with multiple interpretations of what it is, as well as competing visions about what it can be used for (Quinsee & Sumner, 2005). These range from the JISC definition of a system that encompasses "*the whole range of information systems and processes of an institution (including its VLE if it has one) that contribute directly or indirectly to learning and the management of that learning*" (University of Brighton, 2003:14), to a more limited view that sees it as an enhanced VLE (Holyfield, 2003). There is, however, agreement that an MLE involves a 'whole institution' approach as it concerns the linking of systems and faculties that are already provided across an institution such as finance,

administration, library etc. (Holyfield, 2003). As a report by the British Educational Communications and Technology Agency (BECTA, 2003) points out, an MLE is more than just a VLE as, with the development of an MLE, it is essential to have "interoperability of data and content".

For clarification, a VLE refers to the "*component(s) of an MLE that provide the "online" interactions of various kinds which can take place between learners and tutors, including online learning*" (University of Brighton, 2005:2). VLEs tend to be closed systems, internal to the HEI, institutionally-owned and are a collection of tools for "*communication, uploading content, assessment and administration of student groups"* (Hughes, 2009: 15). This aspect of the system is often referred to in the literature under a whole host of titles including e-learning and LMS (Learning Management Systems) (Devedzic, 2003), online learning (Myers, et al., 2004), computer assisted learning (Laurillard, 1978), computer-mediated learning (Alavi, 1994) and technology enhanced learning (Browne et al, 2008). LMS is the more common reference in literature from the US and Australia.

For illustrative purposes, the model shown in Figure 1-1 is a widely used model of an MLE, as conceptualised by BECTA in autumn 1999 (JISC, 2000). The relationship between a VLE and a MLE can be seen in contrast here. The VLE is a subsystem of an MLE, and plays an important role in delivering content to the learner.

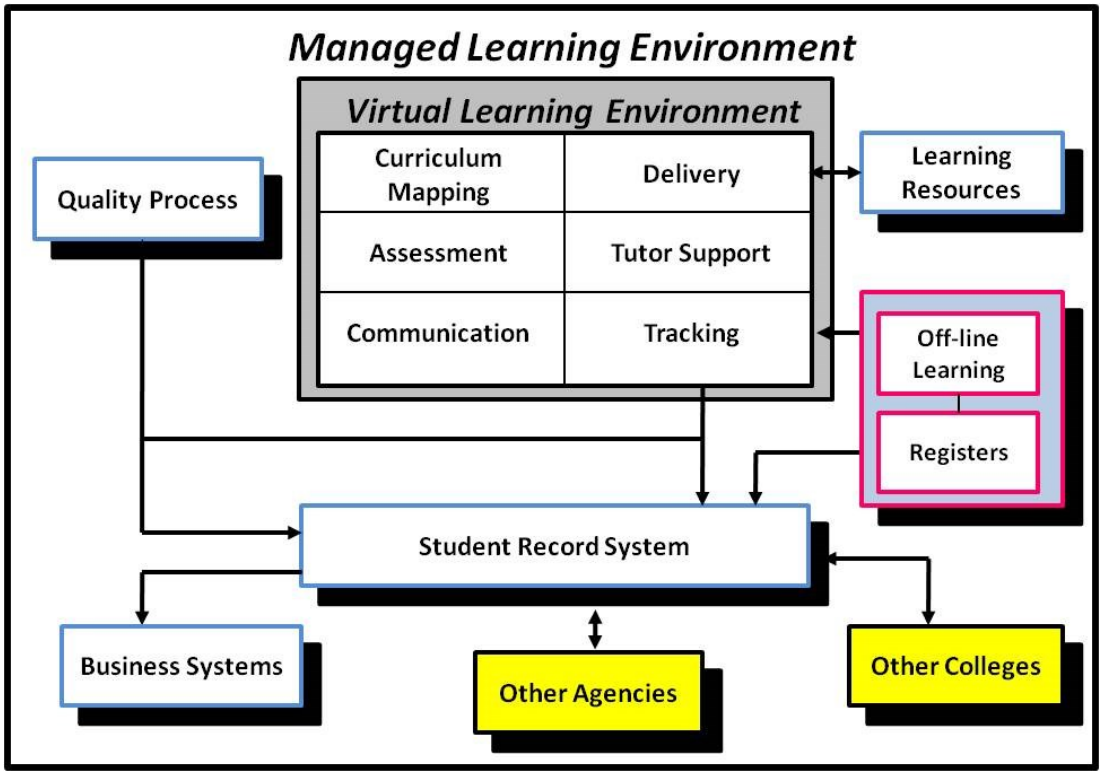


Figure 1-1: Schematic of an MLE (BECTA, 2003)

In the intervening years from 1999 to present day, a period of some 12 years, the MLE conception has remained consistent (JISC, 2011b:2). However, within the development and deployment of an MLE, institutional portals have been rising in popularity and increasingly become the 'standard mode' for gaining the interoperability of the joined up systems (Boys, 2002). An institutional portal is "*a personalised, single point of access to the online resources that support members of an institution in all aspects of their learning, teaching, research and other activities*" (JISC, 2011c).

In 2005, "*limited progress*" was reported in the development of portal based technologies in UK HEIs (Jenkins et al., 2005:6). However, by 2010 (Browne et al., 2010), approximately half (49%) of HEIs reported using a portal as a means of end-user access to institutional systems. This growing trend has afforded users the ability to access both local and remote 'information resources', such as books and journals, 'transaction-based services', such as finance and registration, and 'collaborative tools', such as email and chat (JISC, 2011c). This does suggest however, that the remaining half of HEIs do not have a portal-based MLE.

In 2006, a basic MLE, without a portal, was established at Manchester Metropolitan University (MMU), the author's host institution. For illustrative purposes at this stage, a limited view of an MLE can be found in Figure 1-2, which shows the conception of the MLE at MMU from 2006 through to 2009.

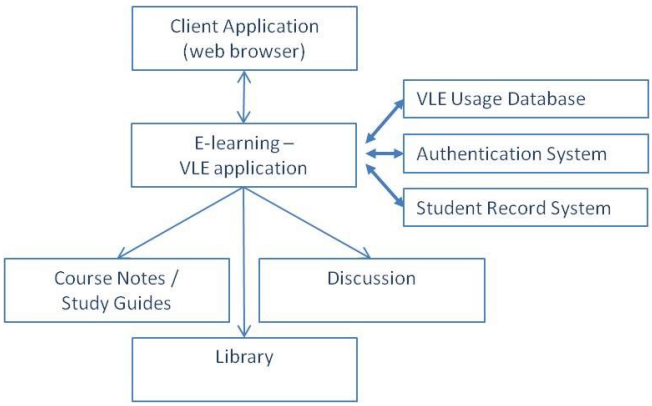


Figure 1-2: Model of MLE at MMU from 2006 to 2009

At MMU, between 2006 and 2009 the MLE was essentially a VLE joined to the Student Record System. Joins such as this can be of high importance to institutions as they prevent the VLE becoming a stand-alone system and increase its capacity to support large numbers of students (BECTA, 2003). This limited MLE conception allows the institution to deliver specific content to students based on their study profile, which benefits students in terms of accessibility of resources relevant to them.

As expected from the findings of the UCISA reports (Jenkins et al., 2005; Browne et al., 2008; Browne et al., 2010), MMU's MLE has been evolving. The original MLE has progressed with components being replaced and reconfigured due to the development of an institutional portal. The 2011 version of the MLE at MMU is shown in Figure 1-3. As can be seen, not only was a portal introduced but finance and email systems were added too.

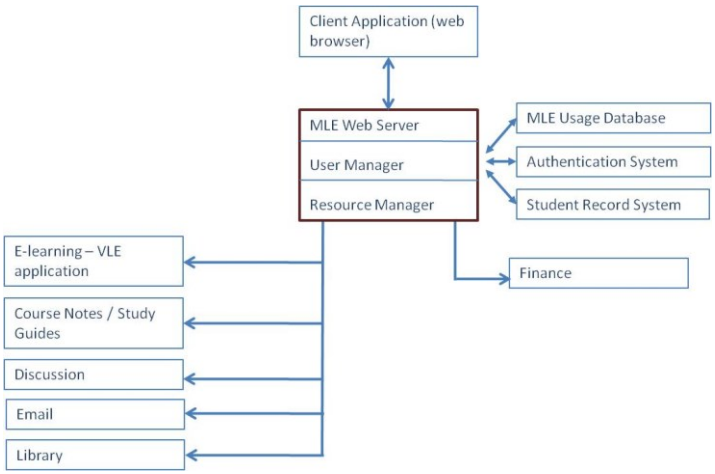


Figure 1-3: Model of MLE at MMU from 2009 to 2011

An example from the literature of a conceptual model of a portal-based MLE is one developed by De Montford University (Eyre, 2001) and can be found in Figure 1-4. The model shows how different components of the system fit together and relate to each other and shows the holistic nature of an MLE.

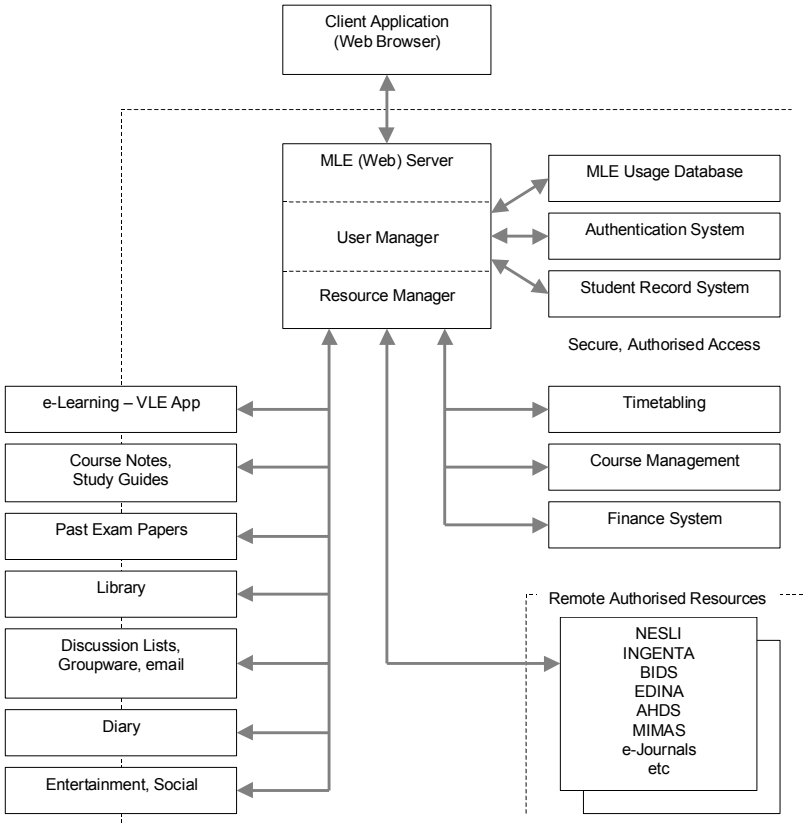


Figure 1-4: Model of MLE at De Montford University (Eyre, 2001)

This conception encompasses numerous other systems including the VLE, library, finance and timetabling that are 'joined up' using an MLE webserver

(Eyre, 2001). This webserver is essentially a portal from where all the services available within the MLE are accessed.

The two institutional MLEs found at MMU and De Montford differed in scope: the early conception at MMU included just two systems and expanded subsequently to become a portal-based MLE; the De Montford model set out with a much greater scope initially, encompassing many technological systems in use within the institution integrated through a portal. These two example institutions illustrate the variation in composition of an MLE although it also highlights the commonality of the inclusion of a VLE. In fact, by 2005 a VLE had become a "mature component" of an MLE and so included in any "MLE mindset" (Browne et al., 2005:4) which shows the embedded nature of a VLE within an MLE development.

The variability of an MLE is highlighted in Table 1-2. This data is based on the pre-existing technologies in use within these institutions prior to them embarking on their MLE developments (JISC infoNet, no date).

	OS Culture	Student Information System	HRM	Finance System	Library	VLE
De Montford University	Mostly Windows	QLS	Rebus	QLX	Talis	WebCT
Writtle	Unix / Windows	HEMIS	Professional Personnel	Resource 320000	Dynix	None
St Andrews	Mixed	SITS	ResourceLink	Aptos	Mixed	Mixed
UEA	Mixed	Bespoke	Bespoke	Bespoke	Mixed	Blackboard
Sunderland	Not reported	SITS	Great Plains	Oracle Financials	Dynix	WebCT
Ravensbourne	Not reported	QLS	None	Mixed	Horizon/ Sunrise	Bespoke

Table 1-2: Example Systems in Use in UK HEIs (JISC infoNet, no date)

As can be seen, even in just a very small sample of six HEIs, there is huge variance in the systems in use. The different systems within each business function i.e. HRM and finance, are shown and mean that varying interoperability requirements are present within the different institutions.

This illustrated variability has meant that a bespoke development is unavoidable as one institutional MLE fits the needs of the host institution but would not suit any other (BECTA, 2003). It also means that an MLE is not available as an off-the-shelf commercial product (BECTA, 2003) although many of the component parts are likely to be. Indeed, there are many different technology solutions that have gained popularity and become ubiquitous under the MLE umbrella within UK HEIs. These are found within the various business functions, such as e-learning, HRM, student records and finance. In fact, in a 2010 UCISA survey, a large number of different systems were reported currently in use for the 14 HEI functions included (Browne et al., 2010).

This discussion has alluded to the complexity found within the variability and developing nature of an MLE. The first level of complexity comes with the variation and evolution of component parts that constitute a locally situated version of an MLE and the bespoke nature required of any such development. This is illustrated with Figure 1-2, Figure 1-3 and Figure 1-4. The second level of complexity is concerned with the wide array of products that institutions are currently using within their various business functions. Table 1-2 illustrates this perfectly and shows the complexity of an MLE development and explains why the developments are bespoke to each institution as no two institutions will display the same set of requirements.

In this thesis, the term MLE will be defined as being an integrated VLE based MLE with "*the whole range of information systems and processes of an institution (including its VLE if it has one) that contribute directly or indirectly to learning and the management of that learning*" (University of Brighton, 2003). Throughout this thesis, the term VLE will be used to refer to the e-learning component of an MLE. As a VLE is a wholly integrated part of an MLE, when this term is used, it is also assumed to be referring to its role within the wider institutional MLE.

The concept of an MLE has been explored in this section and an understanding gained regarding the complexity of a development such as this. The next section looks at the drivers for institutions to develop MLEs.

1.2.3 Institutional Drivers for MLE Development

Whilst there is widespread MLE activity in the HE and FE sector (Figure 1-5), the main drivers behind the decisions to acquire or develop an MLE are unclear, other than an acknowledgment that "you can't not do it" (Collis & Moonen, 2001, ch.2 cited Quinsee and Sumner, 2005). Opportunities for 'streamlining' the student experience, economies of scale and efficiencies, result in many institutions looking positively at MLEs (Quinsee and Sumner, 2005) although institutions feel they have to re-invent themselves and are being "forced to change" (Laurillard, 2002:3 cited Quinsee and Sumner, 2005).

There are many reasons why institutions make the decision to invest resources into developing an MLE. According to research undertaken by the University of Brighton (University of Brighton, 2003), a number of drivers to the development of an MLE were found. The principle reasons quoted are:

- enhancing quality of learning and teaching
- improving access for part time students
- improving access for students off-campus
- widening participation
- student experience
- committed local champion
- to help standardise across our institution
- competitive advantage
- improved administrative processes
- attracting new markets
- attracting home students

As can be seen, the most popular drivers centre around the learner where enhancement of and access to learning materials is paramount. This undoubtedly is one of the reasons why a VLE is at the heart of any MLE development and is a consistent presence in locally situated versions. The collection of tools present within a VLE, such as communication, uploading content and assessment, along with the administration functions, result in a

set of very “powerful resources” of benefit to both the institution and the student (Hughes, 2009:15) and support learning and teaching (Conole, 2004). This integration is intended to enhance the learning experience of the student and is seen as a way of attracting more students to the institution by gaining competitive advantage.

Institutional advantages also figure highly in the drivers for adoption. It is these organisational contexts and priorities, which result in a contextualised MLE with the wide variations in functionality as previously described. It also means that in addressing the needs of the learner, personalised VLE content, driven by a VLE-SRS (Student Record System) mapping to their programme units, is seen as paramount. The alternative to this interoperability is a lengthy manual process and so the efficiency gains realised are also helping to drive institutional adoption of this technology.

This section has addressed the reasons why an institution may want to develop an MLE but what is the development activity of MLEs in UK HEIs? The next section will look at this issue.

1.2.4 Current Development Practices in UK HEIs

MLE activity is fairly widespread among Further Education (FE) and Higher Education (HE) institutions in the UK. A research project undertaken by the JISC in 2003, with a 51% response, found that over 87% of all UK FE and HE institutions were engaged in some kind of MLE development activity (University of Brighton, 2003) as shown in Figure 1-5.

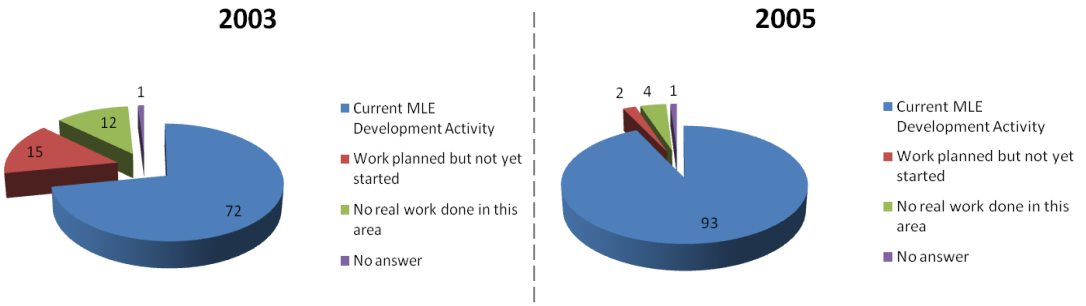


Figure 1-5: MLE Activity Across the HE/FE Sector (University of Brighton, 2005)

Figure 1-5 also shows that in 2003 72% of HE and FE institutions were currently involved in development of an MLE. When this research was

updated in 2005, the situation had changed dramatically. By 2005, 93% of all institutions were involved in some development activity with only 2% of all FE and HE institutions having planned work but not yet started and 4% of institutions not having done any work in this area (University of Brighton, 2005). The ubiquity of the MLE arises from institutional drivers, which, as already discussed, have a tendency to centre around the student. The benefits to the institution are recognised as being necessary to attract students to the institution and also assist in efficiency gains due to the interoperability achieved. This helps to explains why, by 2008, 98% of institutions were found to have a VLE in use (Browne et al., 2008) meaning the development of an MLE in some form was moving nearer to the 100% mark year-on-year.

1.3 Research Question

The previous section has clearly outlined many aspects of an MLE. Once an MLE has been integrated within an institutional setting, an issue that arises is that of evaluation. Therefore, the first research question to arise within this project is the following:

Research Question 1 How can an institution evaluate its MLE?

This section looks at the issue of evaluating these ubiquitous information systems that tend to evolve and vary in composition, context and institutional priorities.

1.3.1 Evaluation of an MLE

Evaluation is recognised as a means of learning about a system (Almstrum et al., 1996 cited Meisalo, et al., 2003) and is a basic feedback function for adoption and improvement of systems (Angell & Smithson, 1991 cited in Smithson & Hirschheim, 1998). However, there currently appears to be no recognised framework for evaluating an MLE within the literature.

It is recognised that evaluating technology used within learning and teaching is complex, challenging and contested (Jackson, 1990; Oliver, 2000; Voigt & Swatman, 2004). As has already been discussed, the nature of an MLE - ubiquitous, evolving, and varying in composition, context and institutional

priorities - brings complexity. Any framework developed for evaluating such a system would therefore need to be flexible enough to deal with these issues if the process were to be usable beyond the realms of an originating study.

A further issue beyond the realms of the physical system itself to consider is that of the stakeholders. An MLE has a rich variety of stakeholders, which builds in further complexity for evaluation of an MLE (Bullock & Ory, 2000; Holyfield, 2003). The involvement of stakeholders, however, means that a good evaluation instrument must be able to cope with the complexity that arises from varying stakeholder needs (Hardman, 2008; Hardman & Paucar-Cacares, 2011).

A full discussion regarding evaluation and its stakeholders is conducted within the Literature Review. Clarification and identification of stakeholders is also discussed in detail.

As sector surveys revealed almost all UK institutions had already embarked on some kind of MLE development, the focus of this evaluation was on evaluation to support localised evolution. Evaluation will be framed in terms of the MLE within its contextual setting on a day-to-day basis, rather than revisiting the decision to embrace MLE technology. As such, it will provide formative feedback that will be utilised on a year-on-year basis to look for improvements in gaining a deeper understanding of the system and its usage.

1.4 Aims of Research

There appears to be no evidence currently in the literature of any frameworks for evaluation of an MLE in use within the UK Higher Education Institutions (HEI) sector. As has already been discussed, 96% of HE and FE Institutions may be interested in such a framework as their MLEs develop and mature. This research aims to propose a framework for evaluating MLEs that is contextualised to UK HEIs and cognisant of institutional variety.

The lack of a standard MLE system could impact on the transferability of the evaluation results detailed within this thesis. However, the process by which

the results were gained, i.e. the evaluation process and methods employed, are designed to be transferable to other institutional settings. This thesis therefore will be process-centric rather than content-based.

1.5 Scope of Project

This project has multiple layers which build in a level of complexity which needs to be broken down. Defining the scope of the project was increasingly important in a project such as this due to the different stages to be reported upon.

Figure 1-6 shows what is included within this thesis and where the boundary lies within the internal and external aspects of this project. Due to the process-centric nature of this thesis, detailed results of the evaluation have been excluded as they do not add any merit, although an illustrative summary of results has been included.

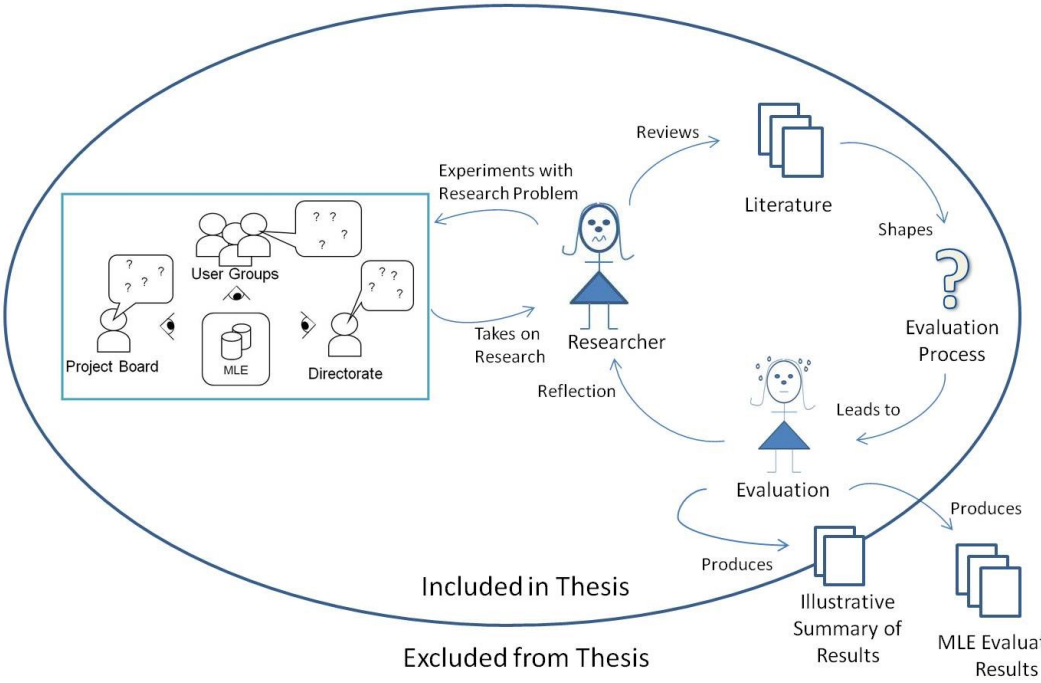


Figure 1-6: Scope of Research Project

For clarity on the focus of this thesis, any learning and teaching technology developments external to the institution will be outside the remit of this study. Since the mid 2000's, there has been increasing interest in the use of Web 2.0, or the "*Social Web*" (Hughes, 2009:15), technologies for the learner in a

digital age. These systems enable *"communication, participation, collaboration and sharing"* and are classified as open systems, external to the institution (Hughes, 2009:5). The systems used are often widely recognised websites including facebook, blogger, twitter, MSN, secondlife, youtube and del.icio.us (Hughes, 2009:15) and will not form a part of this thesis. Therefore, it is only those systems internal to the HEI, forming a part of the MLE development, which will be included in this research project.

1.6 Overview of Thesis

The thesis is structured in chapters, as shown in Table 1-3, starting with an introduction to the research project in Chapter 1 and a review of the literature and methodology employed in Chapters 2 and 3. The results, analysis and discussion are presented in Chapters 4 and 5 with conclusions drawn in Chapter 6 with further work detailed in the final chapter.

Chapter 1	**Introduction** This chapter identifies MLEs as a significant development in HEI information systems: ubiquitous, evolving, varying in composition and emphasis according to institutional priorities and context, multi-stakeholder, and lacking published evaluation. It also provides an overview of the research project and the thesis layout.
Chapter 2	**Literature Review** This chapter makes the case for a contribution based on the lack of MLE evaluation work; draws lessons from evaluation practice developed for evolving, contextualised information systems, and identifies the potential of Soft Systems Methodology for organising an evaluation process for MLEs in UK HEIs.
Chapter 3	**Research Approach** This chapter selects a research approach (participant Action Research in an institutional case study) that is responsive to the emergent, embedded nature of the phenomena being studied and compatible with the Soft Systems approach and distils from previous work guidance for maximising the validity and value of research findings.
Chapter 4	**Results** The Results chapter illustrates operationalisation of the Soft Systems, participant-action-research approach in extensive fieldwork organised as three iterations spanning three academic cycles (2006/07 – 2008/09), presenting

	results gathered through the fieldwork and comparing the iterations.
Chapter 5	**Analysis and Discussion** This chapter reflects on the action-research case study at multiple levels, distilling lessons of specific value to MLE evaluation and to more general evaluation of evolving, embedded information systems, and sharing methodological insights gained from this sustained longitudinal study
Chapter 6	**Conclusion and Recommendations** This chapter presents the case for specific contributions to knowledge arising from the study, showing how insights from the work go beyond those published previously and considering their value to UK HE and wider audiences, and identifies opportunities to extend the study.
Chapter 7	**Further Work** Recommendations for further study are drawn in this chapter.

Table 1-3: Structure of the Thesis

For ease of reference, a pictorial overview can be found in Figure 1-7.

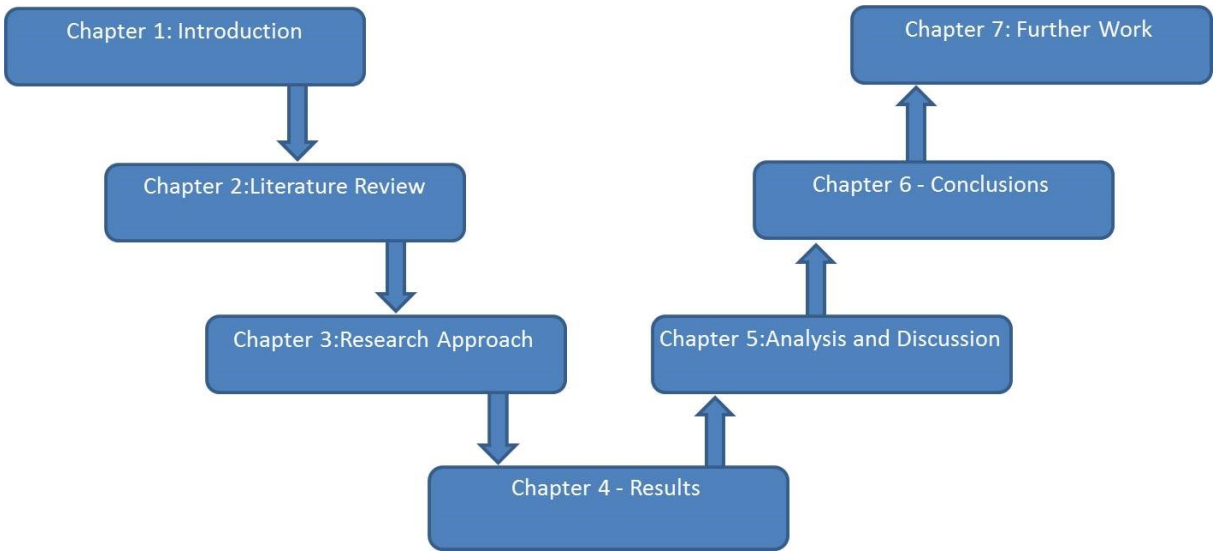


Figure 1-7: Overview of Thesis

1.7 SUMMARY

MLE activity within UK HEIs is thriving with over 98% currently involved in development activities (Browne et al., 2008). Within HE and FE, there is no standard conception of what an MLE is and what it is designed to achieve with each institution having a situated version. There is a consensus that a VLE is at the heart of an MLE but the variations at institutional level are driven by organisational context and priorities.

The overarching research question has also been raised within this chapter. The issue of evaluation of an MLE within a UK HEI has been recognised as having a number of complexities that need to be considered within the concept of an MLE and any evaluation framework. These are due to the system under study being ubiquitous, evolving, and varying in composition, context and institutional priorities, which are driven by multiple stakeholders. Initial investigation has found no two institutions' MLE developments to be the same and so any evaluation framework needs to be adaptable to local conditions.

The next chapter looks at current evaluation practices of technology used to support learning and teaching within HE institutions. It concludes by suggesting an appropriate framework for evaluating an MLE and further refines the research questions.

Chapter 2: LITERATURE REVIEW

2.1 INTRODUCTION

The purpose of this literature review is to gain an understanding of current issues surrounding the evaluation of MLEs used in HEIs in the UK. Attention is paid to how MLEs are currently evaluated and methodologies and methods that have been employed are included along with any problems that exist with current evaluation practices. This will then allow for relevant literature to be highlighted in order to form the basis of this study.

This literature review was conducted in a thematic way but had elements of a systematic literature review informing it. A systematic review of the literature that adhered rigidly to the principles of a systematic review (Pittaway, et al., 2004) was not undertaken as, through a pilot study of this methodology, it was found to be too restrictive due to the cross-disciplinary mode of the subject under study where a wide variety of journals were found to be of importance. However, the basic principles where found to provide a useful base on which to build the full study. The thematic nature of the review therefore allowed relevant insights from alternate disciplines to be used to inform this review.

The review was conducted by:

- the use of various keywords in searching journals / databases / online aggregate websites.
    - the keywords utilised in various combinations were:
        - Evaluat* (wild card allowed for evaluate(s) / evaluation(s) / evaluating(s) to be found)
        - Managed Learning Environment and / or MLE
        - Virtual Learning Environment and / or VLE
        - Higher Education
        - Information Systems Evaluation
- the principal sources searched were:

    - MMU Library electronic databases by title:
        - ScienceDirect
        - ABI/Inform
        - ERIC
        - British Education Index
        - Web of Science
        - Web of Knowledge
    - MMU Library catalogue for academic books
    - online aggregate website - Google Scholar
- following the trail of references from relevant journal articles

The majority of sources came from following a trail of references gleaned from relevant articles. This was due to a lack of sources when following a general search. When a general search was used, the sources found, although related to the context of the search, principally had two foci: evaluating the learning technologies' impact on learning and teaching from an educational standpoint, such as use as a learning tool; or an evaluation study of the various technologies prior to the implementation of a VLE. These did not match the viewpoint of this thesis i.e. evaluating the systems, post implementation, that deliver the learning and teaching. It was difficult to exclude these sources from the results as the exclusion of keywords such as "MLE" or "VLE" or "Evaluat*" meant that none of the relevant articles appeared and purely focusing on IS evaluation was deemed insufficient in the HE context.

It therefore became a manual search of finding those sources that were relevant, and discarding those that were not. Once a source of information was considered important, its references were scrutinised and used as the basis for further literature searching. This had a two-fold benefit: previously undiscovered sources were highlighted for exploration; and individual authors were identified as being important and further work by those authors explored. Whilst this was a time-consuming process, it allowed information sources not highlighted via the keyword, database driven route, to be found and utilised.

This literature search highlighted a lack of literature in the specific area of MLE evaluation. No frameworks were found regarding the evaluation of this concept and so the study needed to broaden out and include relevant literatures from the information systems and evaluation fields.

The principal themes that emerged via this literature search were categorised into: generic evaluations, Information Systems (IS) evaluation, educational technology (edtech) evaluation. Each of these areas was found to be useful in informing the development of a framework for evaluating an MLE.

The following section will summarise the criteria for developing a framework for evaluating an MLE. This will be followed by a synthesis of the literature utilised to develop the framework.

2.2 MLE EVALUATION

2.2.1 MLE Evaluation Framework Requirements

The evaluation approach adopted for an MLE needs to ensure it takes account of the conceptualisations as found in Chapter 1. In that chapter, the features and functions of an MLE were explored in detail. A number of criteria emerged which require consideration within an evaluation framework for an MLE. These are summarised here.

It was found that an MLE has become ubiquitous in HEIs since its conception at the end of the 20th century (JISC, 2000) with each system being unique to its environment. Indeed, there are many combinations of systems in use within HEIs in the UK that make up an MLE in situ (Browne et al., 2010) and so this varying composition is an important element for any evaluation framework.

An MLE was found to be evolutionary in nature. As with many technologies, the developments of an MLE are constantly evolving as organisational contexts and priorities change and the system in use matures. These can be changes in the components of the MLE, such as migrating to a new VLE, or further developments in the constitution of those components, such as the

development of an institutional portal. The development of a portal exemplifies the changing nature of the conception of an MLE. In UK HEIs, the use of portals grew from “limited progress” in portal developments in 2005 (Jenkins et al., 2005: 6) to approximately half of HEIs reporting using a portal some five years later (Browne et al., 2010).

There is recognition that an MLE has multiple stakeholders. These will be explored in more detail later in this chapter but these multiple stakeholders need to be taken into account in any framework for evaluation.

Therefore, to summarise, the evaluation framework needs to cope with ubiquitous, evolving IS that vary in composition, context and institutional priorities and are driven by multiple stakeholders. Each of these issues adds a new layer of complexity in a framework for evaluation. In order to explore resolutions to these complexities, literature has been taken from the educational technology, IS and generic evaluation fields. These have been brought together to discuss the issues raised.

2.3 EVALUATION OF MLES

2.3.1 Evaluation Issues

Evaluation is the process by which people make value judgments about things (Oliver, 2000). It is ‘endemic to human existence’ and hence an automatic reaction to a changing situation (Smithson & Hirsccheim, 1998). According to Almstrum, there is only one reason to evaluate and that is in order to learn (Almstrum et al., 1996 cited Meisalo et al., 2003). Viewed in systems terms, evaluation provides the basic feedback function (Angell & Smithson, 1991 cited in Smithson & Hirsccheim, 1998).

The use of technology within learning and teaching has increased in recent years. However, increased use of learning technology has not produced a associated rise in appropriate forms of evaluation (Tricker, et al., 2001; Bullock & Ory, 2000). Evaluation is not an end in itself but seen as a means to an end (Patton, 1997; Voigt & Swatman, 2004) and so emphasis can be

placed on the learning about and thus understanding of the MLE. This understanding is a major contribution, rather than being merely a by-product, of the evaluation (Voigt & Swatman, 2004).

Although the notion of evaluation is rooted in a relatively simple concept, there is widespread consensus that, as has already been highlighted in Chapter 1, evaluating technology used within learning and teaching is complex, challenging and contested (Jackson, 1990; Oliver, 2000; Voigt & Swatman, 2004). This view is not restricted to HE Information Systems (IS) evaluation but also in the wider context of organisational IS evaluations (Serafeimidis & Smithson, 2003).

A number of general reasons have been found to contribute to the complexity and challenges of evaluations of learning technology. Complexity multiplies and evaluation is impeded when: resources do not correspond to the scope of the evaluation; the implications of taking action are ignored (Voigt & Swatman, 2004); and the evaluation is required to serve a diverse set of purposes which require generalisable data for comparison, explanatory information for understanding and are controlled politically to justify decisions (Jackson, 1990).

Further complexity comes from the fact that some of the systems are integrated into prescribed activities such as admissions processes or timetabling whilst others such as the learning process cannot be reduced to such a simple set of descriptors (Holyfield, 2003). This mix of tangible and intangible aspects of the system brings difficulty in measurement with intangible benefits often being reduced to some form of quantification (Rose & Haynes, 1999) which is an over-simplification of the process.

There is also the relationship between evaluation and quality assurance which challenges evaluation as they each have similar aims (Oliver, 2000). Statutory reporting requirements of the government agencies, i.e. QAA, look for evidence of course quality where the criteria of evidence tends to be positivistic (top down, universalistic, managerial and driven by accountability) (Gilroy et al., 2001) which opposes the interpretivist approach called for by

many in IS research to better understand the phenomena (Walsham, 1995; Avgerou, 2000; Serafeimidis & Smithson, 2003).

Evaluation of any IS in its traditional (formal/rational or functionalist) form is seen as an external judgement as if the IS system exists in isolation of the human and organisational elements (Serafeimidis & Smithson, 2003). Excessive importance has been placed on the technological and financial aspects which results in the organisational context of the IS system being ignored (Serafeimidis & Smithson, 2003). This has resulted in greater attention being paid to prescribing how evaluations should be carried out rather than analysing and understanding the role and organisational impacts of the IS (Smithson & Hirschheim, 1998).

2.3.2 Evaluation Stakeholder Issues

The complexity of evaluations, however, cannot be managed by simply increasing the number of evaluation criteria (Voigt & Swatman, 2004). In overcoming the problems of evaluation, the needs of the participant(s), stakeholder(s) or audience(s) are seen as key (Bullock & Ory, 2000; Williams, 2002; Mcnaught & Lam, 2005) and attending to their interests can resolve many problems associated with evaluation (Williams, 2002).

Williams (2002) found that approaches to evaluation differ in many ways and evaluations are done for particular participants whose values vary. When the approach pays attention to the participants' values then they have sufficient interest to use the evaluation results:

> 'Evaluation can be a powerful partner for improving higher education if all the relevant participants are involved systematically in the evaluation process' (Williams, 2002:16).

Patton (1997) found examples of evaluations that have been perfectly executed and well documented but have then sat unread on shelves once completed.

Serafeimidis & Smithson (2003) point out that many authors argue that an organisation-wide participatory stakeholder analysis is the first step to the

formulation of any evaluation. Evaluation stakeholders are individuals or groups who have a stake or vested interest in (Patton, 1997) or are put at some risk by (Guba & Lincoln, 1989) the evaluation findings; directly or indirectly. Serafeimidis & Smithson (2003) made the point that the existing literature at that time lacked any systematic guidelines to assist in stakeholder identification and classification although various publications since have suggested alternatives (Alexander, 2005; JISCInfoNet, 2011). Farbey et al. (1993), however, developed an evaluation 'stakeholder map' (based on Gilbert et al.,1988 and Mintzberg,1983, cited in Farbey et al., 1993) for evaluating IT in organisations.

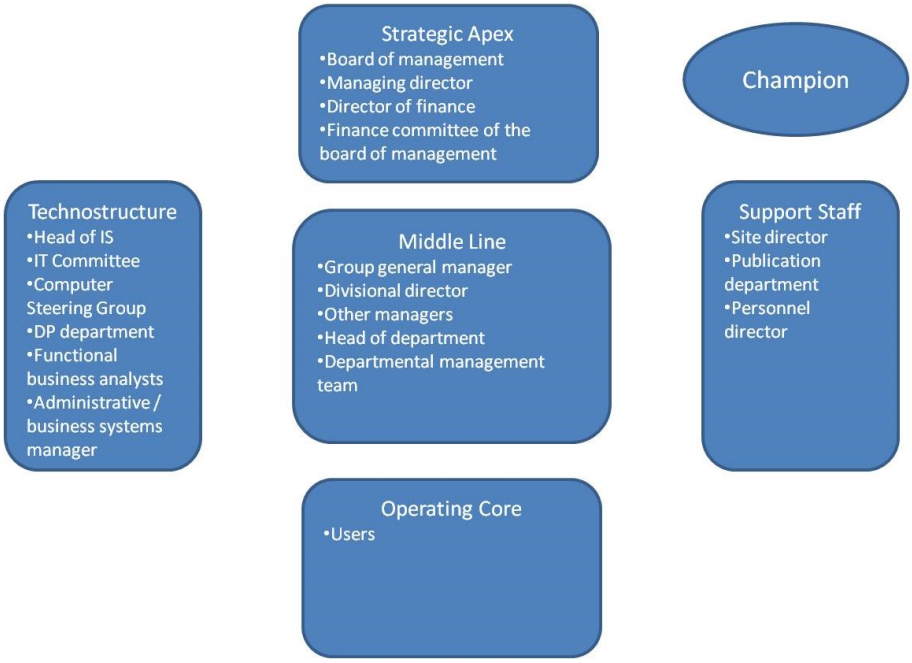


Figure 2-1: Evaluation Stakeholder Map (Farbey et al., 1993: 56)

This mapped organisational stakeholders into groups: Strategic Apex; Middle Line; Technostructure; Support Staff; Champion; and Operating Core. From an MLE perspective, these stakeholders may include: academic staff (Operating Core); administration staff (Support Staff); students (Operating Core); Deans (Strategic Apex); project coordinators (Champions); information systems managers (Technostructure); faculty secretaries (Middle Line). Clarification of the identification of stakeholders on a local level is important

and this may change from one institutional MLE to another, dependant on the organisational structure within the institution.

As was pointed out in Chapter 1, an MLE has a rich variety of stakeholders which builds in complexity for evaluation of an MLE. This complexity arises from the stakeholders: having different views of the world; using different vocabularies and tools to describe the world; and playing different roles within the MLE context (Holyfield, 2003). Even small scale instructional technology evaluation efforts are challenged when it comes to meeting multiple stakeholder needs although searching for overlapping interests may help to address diverse stakeholder needs (Bullock & Ory, 2000). A widely usable MLE evaluation instrument must be able to cope with the complexity that arises from the varying needs of its diverse range of stakeholder (Hardman, 2008).

Williams (2002) found, after reviewing different theories relating to evaluation (e.g. Stake's 'Responsive Evaluation' (1975); Guba and Lincoln's 'Fourth Generation Evaluation' (1989); Patton's 'Utilization Focused Evaluation' (1997); Fetterman's 'Empowerment Evaluation' (1996) – all cited in Williams, 2002), that in the main they paid attention to the needs of the evaluation stakeholders. These participant-oriented evaluation approaches all agree that the evaluations are carried out for particular participants whose values vary, even though the approaches to evaluation differ. He also found that, taking the theories of evaluation together, there are three key evaluation elements:

- which stakeholders care
- what do the stakeholders care about in terms of their: needs, values, definitions and questions, so that the results of the evaluation help them
- and to ensure stakeholders are involved in all aspects of the evaluation process from the design through to interpreting the results to assist in their decision-making process.

The literature so far supports this view. Finding out who the stakeholders are and what they care about are the first steps to strengthening the utilisation of

the evaluation results (Bullock & Ory, 2000; Williams, 2002; Serafeimidis & Smithson, 2003; Mcnaught & Lam, 2005).

2.3.3 Learning Technology Evaluation

Researchers in the field of learning technology evaluation tend to be academics carrying out their own studies (Oliver, 2000). Oliver (2000) suggests that this is due to the conditions of funding for the type of self-contained projects that are funded for learning technology research and development in HE. The conditions commonly state that the project team should be able to demonstrate that they achieved their aims, usually through evaluation (Oliver, 2000). Whilst the literature recognises that attending to stakeholder needs are key, other than in a small number of cases (Bullock & Ory, 2000; Williams, 2002), the needs of stakeholders are not considered in the evaluations reported. This could be because evaluations are often small scale, carried out by academics evaluating their own individual projects and using the results for their own purposes. This position could also contribute to the lack of research into who the stakeholders of IS systems used in HE are, and what their needs are. This situation, however, is not acceptable as institutions across the UK, and no doubt globally, implement IS systems that encompass the whole institution. The development of research needs to reflect this change.

The practice of academics carrying out their own evaluations on their own projects has led to a diverse range of backgrounds and disciplines of researchers, i.e. education, psychology, computer science etc, each with their own traditions, values, criteria and practices. This has meant that different members of the learning technology research community find some methods of evaluation more persuasive than others resulting in a long running ‘paradigm debate’ focusing on qualitative versus quantitative evaluation methods (Oliver, 2000).

2.3.4 The Paradigm Debate

This ‘paradigm debate’ is the dominant discourse that takes place in the literature regarding evaluation of technologies used within HE. Quantitative

data has often been emphasised over qualitative due to the nature of impact studies commonly measuring achievement grades and attitudes pre and post technology (Bullock & Ory, 2000). The absence of qualitative data, however, has frequently led to a lack of understanding of why differences did, or did not, occur (Bullock & Ory, 2000). It is now widely accepted that evaluation needs to embrace both qualitative and quantitative measures (De La Teja et al., 2003; Breen et al., 1998 cited in Oliver, 2000). The quantitative elements could allow for broad generalisations as they draw attention to the high-level patterns with the qualitative elements revealing the rich variety of individual phenomena that underlie such patterns.

The 'paradigm debate', however, is not peculiar to evaluations in learning technology research but is also found within the wider IS research community (Goles & Hirschheim, 2000). Indeed, Goles & Hirschheim (2000) suggest there needs to be an end to the 'paradigm wars' and a move to a position of 'paradigmatic coexistence'. Collecting different kinds of data by different methods from different sources provides a wider range of coverage. This may result in a fuller picture of the unit under study than would have been achieved otherwise. Moreover, using multiple methods increases the robustness of results, because findings can be strengthened through triangulation (Kaplan & Duchon, 1988). Meeting the needs of these different participants is however recognised as a challenge but using a multi-method approach has been found to meet the needs of their unique preferences (Bullock & Ory, 2000).

2.3.5 Evaluation in Practice

Evaluation in the Educational Technology (edtech) literature primarily centres on activities that would fall within the boundaries of a VLE - no studies were found that look at other component parts of an MLE. The literature is very practical, providing examples of the practice of evaluation, but with little evidence of any theoretical models on which the evaluation was based. The underlying theories are either new or still under development and there is no widespread agreement as to how the fundamental tasks of evaluation should be performed (Devedzic, 2003). The reason for this could be two-fold. It

could be linked to the individual academic projects taking value from their own personal viewpoint. This is supported by an interview with Allan Avner, an evaluation specialist on one of the first computer instruction delivery systems, who stated that his evaluation approach was based on “a bit of this and a bit of that” (personal communication, 1999 cited Bullock & Ory, 2000). It could also be linked to what has been found in practice in organisational IS evaluation whereby a gap exists between academic theories, commercially available methodologies and actual evaluation practice (Serafeimidis & Smithson, 2003).

In practice, no single evaluation approach or model rises above the others when hundreds of edtech impact studies are reviewed (Bullock & Ory, 2000). Examples of the types of studies carried out include student perceptions (Tricker et al., 2001; Milliken & Barnes, 2002; Ballard et al., 2004), student uptake (Urquhart et al., 2003), the use of group decision support systems (Alavi, 1994), course quality (Gilroy et al., 2001), learner attitudes (Spellman, 2000), student learning (Laurillard, 1978) and effect on learning outcomes (Boyle et al., 2003, O'Toole & Absalom, 2003; Young et al., 2003). Interestingly, there was only one piece of literature found that evaluated the VLE in use from the faculty perspective (Myers et al., 2004).

Most of these studies are quantitative studies in line with the majority of IS research (Chen & Hirschheim, 2004). The samples used, as would be expected, are classes of their own students. Again, this could be linked to the practice of an individual academic developing their own learning technology for use with a particular class, who are often the only users of the technology under investigation. However, when evaluation is carried out on a comparison basis, an issue of ethicality emerges as in the case of the evaluation carried out by Alavi (1994). This was carried out using three groups of students; one group taught in the traditional manner whilst the remaining two groups were exposed to the new learning technology. The results of the evaluation showed that the groups exposed to the new technology had better assessment results than those students who were in the control group of traditional teaching. This situation raises ethical issues

about the use of this type of comparison where one group potentially is not exposed to a learning technology for the purposes of evaluation (Oliver, 1997 cited Bullock & Ory, 2000).

Leading on from the practical literature is the question of evaluation metrics; the particular measures used to evaluate a system. In a review of 355 studies into the impact of technology-enhanced instruction, Russell (1999 cited Bullock & Ory, 2000) found a wide assortment of measures or dependant variables were used. These included (in no particular order): classroom achievement exam score; standardised test scores; course grades; course assignments or products; student behaviours; student retention; student attitudes; ratings of instruction; and costs.

These metrics have quite a narrow focus based around the student, which in an educational environment is obviously important. However, there must be other aspects of the system that need to be evaluated. From the evidence already found within this literature review, the metrics of evaluation should be established based on the needs of all key stakeholders (Hardman & Paucar-Cacares, 2011).

2.3.6 Conclusion

It would appear that in the practice of evaluating MLEs in HE, there is no one way of carrying out evaluations. Different evaluation practitioners take value from different measures of evaluation. Different methodologies have been employed and, depending on what the evaluations were for and the personal preference of the evaluator, a different evaluation approach was followed.

During the course of this Literature Review, no evidence was found of any frameworks in use that are sufficient to cope with the complexity of evaluating MLEs on an institution-wide basis. In fact no published literature was found that evaluated any kind of institution-wide education IS systems. This leaves a gap in the literature which is the focus of this research project.

In selecting an appropriate framework to evaluate an MLE, a number of issues need to be taken into account. These include issues raised within this

literature review and the introduction chapter. These criteria include the need to:

- be able to capture the locally situated version of an MLE
- cope with the complexity of a system that has an unspecified number of variables
- identify and encompass stakeholders needs to strengthen results utilisation
- and gather data on patterns and varied underlying processes to understand why certain phenomena have been observed.

In the next section, the evaluation framework that is be used in this research will be considered with reasons why this framework has been chosen.

2.4 SUITABLE FRAMEWORKS

After reviewing the literature, there appears, currently, to be no recognised frameworks for evaluating an MLE. In deciding on a suitable framework for evaluation, the criteria that emerged from the review of the literature, and the vagaries of an MLE, needs to be accounted for. Any framework needs to have the ability to cope with the variety and complexity in evaluating an MLE in situ. These requirements dictate a need for a framework that has inherent flexibility in order to ensure all the criteria for an evaluation framework are met.

In fulfilling these requirements, a methodology, not a method, is believed to be more suitable. This is because a method, or technique as it is commonly known, can be seen as the undertaking of particular activities (such as conducting a survey, interviews or observations) with a clear and well defined purpose that results in knowledge about different aspects of the world (Mingers, 2001; Mingers & Brocklesby, 1997). The flexibility requirements of a framework for evaluation, as already discussed, make this approach unsuitable as one, some or all of the alternative research methods open to a researcher need to be employed if the desired flexibility is to be realised. It would be impossible at the start of each round of evaluations to know which

methods were most suitable as the evaluation criteria may change from one iteration to the next. As was discussed earlier in this chapter, the use of multiple methods will strengthen the findings of evaluation through triangulation (Kaplan & Duchon, 1988) and meet the unique needs of the different participants to the evaluation (Bullock & Ory, 2000).

A methodology, on the other hand, uses 'a structured set of guidelines or activities to assist people in undertaking research or intervention' (Mingers & Brocklesby, 1997:490) and is used in unstructured, undefined problem situations (Sorensen & Vidal, 2006). The term, methodology, is used in literature with a variety of meanings (Mingers, 2001:242). These are: "method-*ology"* meaning the "study of methods" (Checkland, 1981 cited in Mingers, 2001); the particular research methods that have been used for a research study whereby every individual piece of research has its own distinct methodology; or in a more general way to describe the combining of various research methods where the researcher can choose the methods most appropriate to the study (Mingers, 2001).

In the field of Management Science (MS), over the last 50 years, a great number of MS methodologies have developed rapidly. This has, to a great extent, been due to the development of systems thinking and the increasing use of systems ideas in management science in the form of the so called systems based methodologies (Jackson, 1991). Although most of these methodologies have been applied in different areas and domains such as Operational Research (OR), Systems Practice and Information Technology; the current tendency is to group them under the umbrella of Management Sciences Methodologies (MSM) (Jackson, 1991; Flood & Jackson, 1991; Mingers, 1999).

Within the concept of MSMs or OR, there is the distinction between 'hard' and 'soft' approaches. A 'hard' approach is one where the problems are seen as well-defined and well-structured with the desired end result made explicit. 'Soft' methodologies, on the other hand, deal with ill-defined, problem situations (Checkland, 1981, 1999; Checkland & Scholes, 2003) like those

found in human activity systems (Rose & Haynes, 1999). Soft OR emerged during the 1970s as a direct response to the failed attempts at using hard OR (or 'classical OR') approaches for social problems where disillusionment and criticism of the approach were wide-spread (Lane, 1994).

As this research involves a social system were the actors play an important role, a soft approach, that adheres to a subjective/interpretivist paradigm in management sciences, is considered to be the most appropriate. As Paucar-Caceres and Pagano (2009) point out:

> 'The interpretivist paradigm is the one that underpins the methodologies in this [soft] group. […]These management science methodologies try to alleviate or dissolve the systems of problems rather than solving it, focusing on learning rather than optimising; Jackson (2003) groups them under what he calls systems approaches that 'explore purposes'. This paradigm is probably the most well-known and sometimes regarded as the one representing 'soft' OR; it is certainly the most populated in terms of the number of methodologies adhering to it.'

A number of methodologies could be classed as soft 'OR', such as Soft Systems Methodology, Interactive Planning, Strategic Assumption Surfacing and Testing, Cognitive Mapping (Paucar-Caceres & Pagano, 2009) and Strategic Choice Analysis (Sorensen & Vidal, 2006), and could be suitable for this research project. After reviewing their main features, the familiarity of the author with them and the main characteristics of the MLE to be evaluated, it was decided to shortlist three. In the next section the following specific methodologies will be reviewed: Strategic Option Decision Analysis; Strategic Choice Analysis; and Soft Systems Methodology.

2.4.1 Strategic Option Decision Analysis (SODA)

SODA is designed to be used as a *consultancy* tool in solving 'messy' problems and provides a set of techniques and tools within a problem solving framework with its roots in OR (Eden & Ackermann, 2001). Working with groups of people to construct individual cognitive maps, this approach facilitates capturing the perceptions of, and the thinking about, the problem situation (Sorensen & Vidal, 2006). The developed maps for each individual, after a process of validation, are then merged to form a framework for

discussion where group consensus is sought and resultant actions are planned (Rosenhead, 1996; Sorensen & Vidal, 2006).

2.4.2 Strategic Choice Analysis (SCA)

SCA is a methodology designed to cope with complexity and the 'interconnectedness' of problems in problematic situations and decision making (Friend, 2001; Sorensen & Vidal, 2006). It has its root in OR and has been used in strategy development and planning, especially in public organisations (Sorensen & Vidal, 2006).

The methodology focuses on the decision areas and comparisons are made between alternative possible decisions (Friend, 2001; Sorensen & Vidal, 2006). Through a four mode planning process of *shaping, designing, comparing* and *choosing,* attention is paid to 'key uncertainties' which assists the group in identifying priorities (Friend, 2001; Rosenhead, 1996). The four different modes can be used in a linear form although, as the use of SCA is often used in situations of 'planning under pressure' (Friend & Hickling, 1997), operationally, users often jump between the different modes as their planning evolves (Sorensen & Vidal, 2006).

2.4.3 Soft Systems Methodology (SSM)

SSM is a well-established social science research tool (Rose, 1997). It has been used in both limited and wide-ranging situations in both the public and private sector for the past 30 years (Checkland, 2000). Whilst it has been used to evaluate Public Sector Systems, such as an IS in an NHS setting (Rose & Haynes, 1999), an extensive literature search has found no evidence of its use in a HE IS context.

SSM is not about analysing systems found in the world but about applying systems principles to structured thinking about things that happen in the world (Rose & Haynes, 1999) and looks to improve 'messy' situations (Sorensen & Vidal, 2006). It is evaluatory in nature as it compares conceptual models of potentially realisable systems with each other and the real world, and derives 'systemically desirable and culturally feasible' improvements

(Rose & Haynes, 1999:207). These issues make it ideal for carrying out evaluations where the need to learn about and understand the complexity of the phenomena is explicit from the outset.

2.4.4 The Framework for Evaluation

The framework chosen for this study is Soft Systems Methodology (SSM) as it is the methodology that already has a track record in carrying out evaluations although not within the context of this research project. It also has the ability to cope with all the issues of evaluation as previously discussed. A full and detailed analysis of SSM is the subject of the next section.

2.5 SOFT SYSTEMS METHODOLOGY

SSM is based upon 'Systems Thinking' - using systems concepts to tackle real-world problems. It uses an interpretivist philosophy and has emerged as an organised learning system (Checkland, 2000). It deals with the complexity of human behaviour, and with organisational problems that have many indeterminable variables, by attempting to take a holistic view of the inter-relations of the component parts (Rose & Haynes, 1999). This aspect of SSM makes it ideal in overcoming the problem of dealing with IS in isolation from its human and organisational components and allows the MLE to be evaluated and understood as a whole instead of the conventional, reductionist approach which tends to reduce phenomena into smaller and smaller components in order to understand them (Rose & Haynes, 1999).

One of the major strengths of SSM, from the point of view of this research, is its ability to cope explicitly with differing stakeholder views via the concept of *Weltanschauung* or 'world-view' of the different social actors (Rose & Haynes, 1999). SSM is participative and collaborative (Rose, 1997) which is ideally suited to the idea of stakeholder involvement in an evaluation process. This means that the needs of the different stakeholders within an MLE can be taken into account thus strengthening the chances of utilisation of the research results rather than consigning them to becoming weighty bookends (Hardman, 2008; Hardman & Paucar-Cacares, 2011).

A model of the basic shape of SSM as an evaluation tool can be seen in Figure 2-2. The model shows how knowledge about a system is built upon previous knowledge learnt and that 'activity models' (Checkland & Scholes, 2003) are built to conceptualise current activities. Due to the iterative nature of the model, evaluation complexity builds as the experience and situational understanding of the evaluator grows (Voigt & Swatman, 2004) thus leading to greater understanding of the system under study.

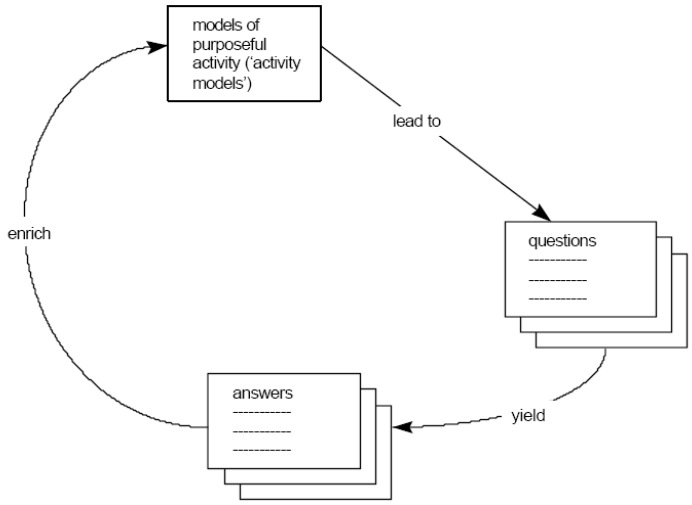


Figure 2-2: The Shape of SSM as an Evaluation Tool (Checkland, 1996 cited Rose & Haynes, 1999)

SSM, however, does not come without its problems. It is time-consuming (Rose & Haynes, 1999) and whilst it is not designed to be a prescriptive model, in the early days of use by a researcher, that is essentially what it is, until internalisation of the concept is reached (Checkland, 2000).

In the experience of Rose & Haynes (1999), IS evaluation using SSM at the NHS failed to meet expectations as even though the process was 'systemically feasible' it was not, in the circumstances surrounding the NHS at that time, 'culturally feasible. This, however, does not detract from using this model as a means to test its ability to evaluate technology used within a HE context and a core concept of this research will be to establish whether this well-tested social sciences research tool can deal with the complexity of an MLE (Hardman & Paucar-Caceres, 2011).

Within the formal model of SSM, there are measures of performance which indicate progress or regress in trying to achieve an overall objective (Checkland, 1999). These measures of performance check the transformation process (the conversion of some input into some output) as defined in the root definition (Checkland, 1999). The criteria are the 5Es (Checkland & Scholes, 2003:A24-25): efficacy (E_1); efficiency (E_2); effectiveness (E_3); ethicality (E_4); and elegance (E_5). The core set of measures are E_1 - E_3 with E_4 and E_5 being added by Checkland after a thirty year review of SSM had been carried out (Checkland, 2000).

These measures are designed within SSM to judge the success or otherwise of the transformation process (Checkland, 1999). The first dimension, efficacy, checks whether the means chosen actually works in producing the output. The second, efficiency, considers whether the transformation was carried out with the minimum use of resources. The final core measure, effectiveness, checks whether the transformation has achieved its longer term aim as expressed in the root definition. For the two extended measures: ethicality checks whether the transformations are morally correct; and elegance checks whether the transformation is an aesthetically pleasing transformation.

In bringing together the multi-method approach to evaluation and the SSM evaluation measures, a proposed framework to evaluate MLEs can be seen in Figure 2-3. This framework shows how each of the measures can be assessed using a multi-methods approach in order to highlight, learn about and understand the phenomena (Hardman & Paucar-Cacares, 2011).

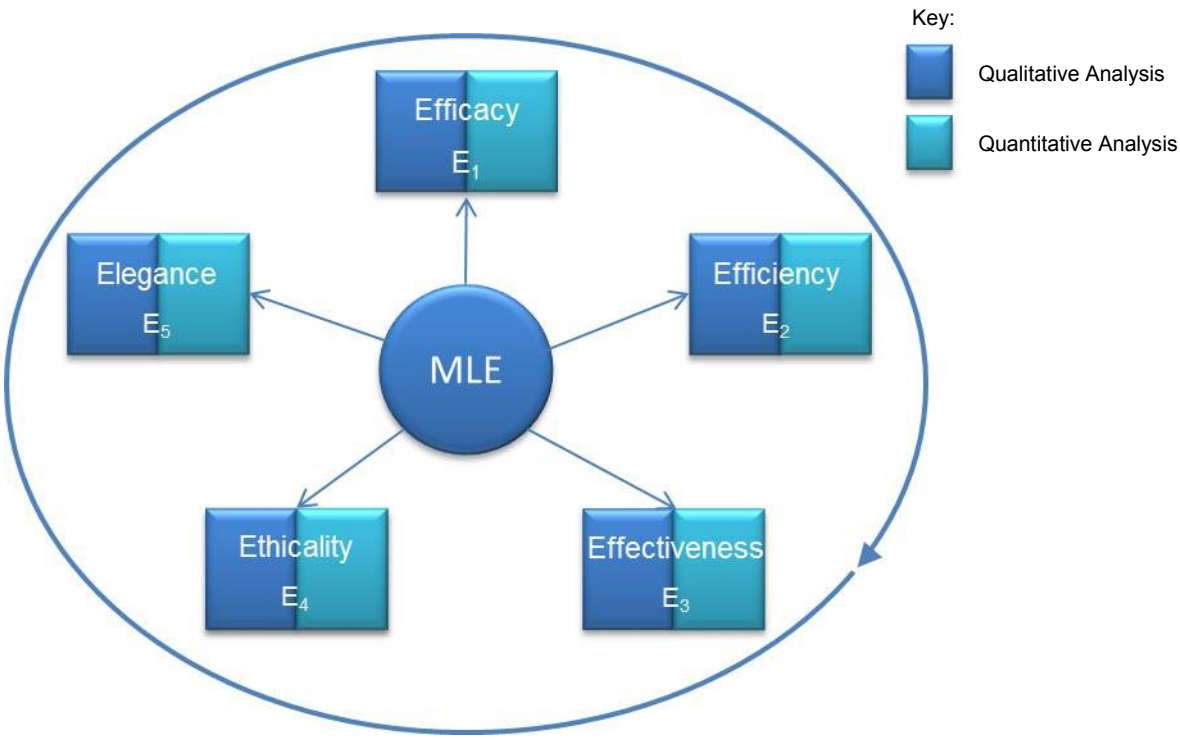


Figure 2-3: Measures of Performance of an MLE (Hardman & Paucar-Cacares, 2011 based on Checkland & Scholes, 2003)

However, these measures of performance are generic measures that can be used to judge the performance of any human activity system. There is no evidence of any research that has been undertaken to assess their worth in measuring the transformation process of MLEs in UK HEIs (Hardman & Paucar-Cacares, 2011). This research questions whether they are indeed the correct measures or whether the model needs to be adjusted in any way to reflect the needs of the stakeholders of an MLE.

SSM, through the issues raised, is deemed to be a promising framework to evaluate an MLE. It is already well established in the field of IS research as a social science research tool, but has not been used in the field of MLE evaluation. It has the ability to cope with the criteria of evaluation as highlighted in the evaluation literature and it is therefore deemed a potentially suitable framework.

2.6 RESEARCH QUESTIONS

In the first chapter, the overarching question of evaluating MLEs in a UK HEI was raised. The question asked was:

Research Question 1 How can an Institution evaluate its MLE?

Based on the findings of the literature review, this question can be refined through further questions.

In selecting SSM as the framework for evaluation, a number of research questions are raised. These are:

Research Question 1a Can SSM provide a suitable framework for evaluating an MLE?

Research Question 1b Do the Measures of Performance (5Es) encompass all the evaluation criteria, based on stakeholder expectations, for an MLE in UK HEIs? If not, what adjustment to the Measures of Performance would contextualise them to MLEs in UK HEIs?

A further issue raised within the literature review was the adoption of a stakeholder approach to evaluation. This involved the identification of stakeholders to the MLE at a local institutional level and finding out their requirements for evaluation. Therefore, in operationalising the research, a further research questions is raised:

- How should stakeholders be identified and what are their evaluation requirements?

These research questions form the basis of this research project. As can be seen, the focus of the first two research questions are very much on the process of evaluation rather than content, thus increasing the transferability

of the findings. The final question focuses on the stakeholder and gaining an understanding of who the stakeholders are and appreciating their requirements.

2.7 SUMMARY

This chapter has highlighted the current evaluation practices of institution-wide IS systems in HEIs and found no evidence of any frameworks in use that are sufficient to cope with the complexity of evaluating MLEs on an institution-wide basis.

It was found that the evaluation framework needed to cope with the complexity of a ubiquitous, evolving multi-stakeholder information system that varies in composition, context and institutional priorities, which an MLE has been shown to be. An appropriate framework must therefore be able to:

- capture the locally situated version of an MLE
- cope with the complexity of a system that has an unspecified number of variables
- identify and encompass stakeholders needs to strengthen results utilisation
- and gather data on patterns and varied underlying processes to understand why certain phenomena have been observed.

Based on these criteria SSM has been identified as a promising framework to evaluate an MLE. It is already well established in the field of IS research as a social science research tool, but has not been used in the field of MLE evaluation.

The following research questions have therefore been raised:

Research Question 1 How can an institution evaluate its MLE?

Research Question 1a Can SSM provide a suitable framework for evaluating an MLE?

Research Question 1b	Do the Measures of Performance (5Es) encompass all the evaluation criteria, based on stakeholder expectations, for an MLE in UK HEIs? If not, what adjustment to the Measures of Performance would contextualise them to MLEs in UK HEIs?
Research Question 2	How should stakeholders be identified and what are their evaluation requirements?

The next chapter will look at how the research was operationalised through the methodology and methods employed. The philosophical issues that underpin this research will also be looked at to gain an understanding of the nature of knowledge gained.

Chapter 3: RESEARCH APPROACH

3.1 INTRODUCTION

The purpose of this chapter is to outline the methodological and philosophical issues surrounding this research. This chapter will discuss in detail the philosophical and methodological approach, Action Research, considered most appropriate to this study. This will allow those who may benefit from this research to appreciate the strengths and weaknesses of the approach taken.

The research context is also discussed along with an explanation of how the study was operationalised within the methodological paradigm. Due to a longitudinal, Action Research approach being considered the most appropriate methodology, as discussed in the next section, this chapter also contains a discussion on the data gathering instruments employed within each iteration. In describing a research approach, it is not usual to consider any results. However, as this study is iterative, whereby each iteration is used to inform incremental changes and improvements to the next iteration, an explanation of what considerations drove these changes is provided within this chapter.

3.2 RESEARCH QUESTIONS

The literature review identified the importance of having an evaluation process for an MLE. SSM was selected as a candidate framework for evaluation and a number of research questions were raised:

Research Question 1 How can an institution evaluate its MLE?

Research Question 1a Can SSM provide a suitable framework for evaluating an MLE?

Research Question 1b Do the Measures of Performance (5Es) encompass all the evaluation criteria, based on stakeholder expectations, for an MLE in UK HEIs? If not, what adjustment to the Measures

of Performance would contextualise them to MLEs in UK HEIs?

Research Question 2 How should stakeholders be identified and what are their evaluation requirements?

In answering these research questions, it is important to understand the methodological approach and the philosophical stance underpinning the approach as it inevitably shapes the contribution being offered. The articulation of this approach is undertaken next followed by how this approach was operationalised.

3.3 Methodological Approach

This research has been conducted using a longitudinal Action Research methodology which is the subject of this section. Consideration of the Action Research methodology will be the focus of the first section.

3.3.1 Action Research

The methodology most appropriate to this research is Action Research - an established social science research tool (Baskerville, 1999). Action Research (AR) has had growing popularity within IS research particularly in Europe and Australia, but lags behind other methodologies, particularly positivist methodologies, in North America (Baskerville & Wood-Harper, 1996). As a method it produces highly relevant research results because it is grounded in practical action, aimed at solving an immediate problem situation while carefully informing theory (Baskerville, 1999). One of the reasons why AR has emerged and is used within Information Systems research is its recognition that a social system can be more deeply understood if the researcher is part of the socio-technical system being studied (Kock et al., 1997).

A wordy but comprehensive definition of AR is offered by Hult & Lennung (1980:247):

> 'Action Research simultaneously assists in practical problem solving and expands scientific knowledge, as well as

> enhances the competencies of the respective actors, being performed collaboratively in an immediate situation using data feedback in a cyclical process aiming at an increased understanding of a given social situation, primarily applicable for the understanding of change processes in social systems and undertaken within a mutually acceptable ethical framework'

Taking each of the issues from this definition and breaking it down into its component parts shows the relevance of the methodology to this research. Each of these components of the definition will be considered and its relevancy to this research discussed.

"*Action Research simultaneously assists in practical problem solving and expands scientific knowledge…"* represents a juxtaposition of action (or practice) and research (or theory) (McKay & Marshall, 2001). AR is a very practical methodology where solving local problems is one of the aims of the research. Importantly, however, for the researcher, is the emphasis on expanding "scientific knowledge". AR is committed to the production of new knowledge through the seeking of solutions or improvements to "real life" practical problem situations (Elden & Chisholm, 1993). This aspect of the methodology is what sets it apart from simply consulting.

This research will be working within a conceptual framework which therefore makes it more than just a problem solving approach (Checkland, 1999). SSM, the theoretical framework for this study, is carried out using AR as its methodology (Checkland, 1999) and so with SSM being the central framework of this research, AR naturally becomes the methodology. In fact, Checkland states that neither theory nor practice are independent of each other and that together they form a never-ending spiral of development (Figure 3-1) (Checkland & Holwell, 1998).

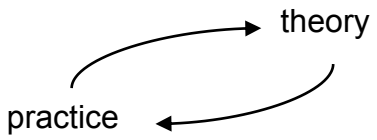


Figure 3-1: Model of Action Research (Checkland & Holwell, 1998)

"… enhances the competencies of the respective actors…"

It is widely recognised that evaluating Managed Learning Environments within HE is complex, challenging and contested (Jackson, 1990; Oliver, 2000; Voigt & Swatman, 2004). Using AR to carry out the evaluation avoids the complexity pitfall because as the design complexity increases so does the required understanding of the evaluators (Voigt & Swatman, 2004). The project environment provides a learning situation in which the whole project team's learning is three-fold: from the actual investigation; from the theoretical implications; and from the process of developing a strategy collaboratively to solve the evaluation problem (Hult & Lennung, 1980).

"…being performed collaboratively in an immediate situation…"

With AR, the researcher is seen as a key participant in the research process, working collaboratively with other concerned or affected actors. They are mutually dependent on each other's skills, experience and competencies in order to achieve problem-solving, knowledge expansion and learning (Hult & Lennung, 1980). One of the distinguishing aspects of AR is the active self-involvement of the researcher, in the context of the investigation (McKay & Marshall, 2001) whereas in methods that adopt a more objectivist approach, the researcher is argued to be an impartial spectator (Chalmers, 1999).

Within this study, the researcher is working closely with the project manager who is responsible for all aspects of the implementation of the MLE. Working collaboratively with the 'problem owner' is essential to the success of the AR process (McKay & Marshall, 2001). Being involved in the evaluation work stream of the project allows the researcher the opportunity to be involved in the development of the evaluation criteria, evaluation instruments, data collection and analysis within the 'live' environment. This level of collaboration is a key feature of AR.

"…using data feedback in a cyclical process…"

Action Research is a cyclical process of problem definition, action planning, implementation, data feedback and evaluation or reflection (Hult & Lennung,

1980; Susman & Evered, 1978; McKay & Marshall, 2001). McKay and Marshall (2001) suggest that the cycle of AR is a dual cycle. They view the AR cycle as being one cycle that deals with 'problem solving' and another that deals with the 'research interest'. The adoption of this 'dual cycle' in both the thinking and practice of AR addresses the criticism that AR is just like consulting (McKay & Marshall, 2001).

In practice, the results that emerge from the evaluations will not only be used to make changes, as appropriate to the MLE, but also to inform the next round of evaluations. The information gained within this cycle will also be used to critique and improve the methodology employed (Dick, 2002). For this research, it is important to ensure that the cycle of 'research interest' is given as much attention as, if not more than, the 'problem solving' cycle as it is this that will be used to inform the research community of the findings; in essence that Action *Research* (Dick, 2002) is conducted.

"… aiming at an increased understanding of a given social situation…"

The type of learning created by AR represents enhanced understanding of a complex social-organisational problem (Baskerville, 1999). This research is concerned with the social phenomena of the MLE and the meaning that the individual users (social actors) ascribe to it. The users are the staff and students of the university and the MLE can be viewed as a social system that is evolving over time (Smithson & Hirschheim, 1998) and not something that is an external object that exists in isolation from the human interaction of the system. As the evaluations become more detailed over time, as knowledge is gained about the system, so the complexity and understanding of this socially constructed information system will grow.

"…primarily applicable for the understanding of change processes in social systems…"

AR follows an interventionist approach; a paradigm that uses methods that inherently brings about change to the research situation (Mingers, 2003b). This means that both observation and participation in the phenomena under study (Baskerville, 1999) is followed and the AR paradigm gives the

researcher the ability to make decisions about changes to the local environment. Indeed AR is all about making changes to the environment and recording the impact of those changes. Failures as well as successful changes need to be recorded and indeed can provide a richer dataset of results.

"…undertaken within a mutually acceptable ethical framework."

Ethical problems can arise if the goals of the researcher and client differ drastically, which causes tension. A mutually acceptable framework needs to be agreed with goals negotiated (Baskerville & Wood-Harper, 1996). A minimum ethical requirement must be that those being researched have a clear value premise of the researcher's work (Hult & Lennung, 1980; Baskerville, 1999).

AR must be conducted within an arena of 'informed consent' (Baskerville & Wood-Harper, 1996) between the researcher and the client. This means that the social actors involved in the research must be aware that this is research and not consulting, with the appropriate expectations explicit from the outset.

AR encompasses lots of different aspects that are totally relevant to this research. In using AR as the methodology, it is important to understand the nature of the knowledge this methodological paradigm generates. The next section will look at the longitudinal aspects of this study.

3.3.2 Longitudinal Research

Longitudinal research gathers data over a period of time on a number of variables (Ruspini, 2002) and tracks changes to those variables (Kaplan & Duchon, 1988). It also focuses on process (Chen & Hirschheim, 2004) which maps favourably to the aims of this research project.

There is a general lack of research in this field with cross-sectional studies favoured over longitudinal (Chen & Hirschheim, 2004) even though the use of longitudinal research can allow for a deeper understanding by the researcher of the impact of technology (Kohli & Devaraj, 2003). It also allows for any 'lag' effects after the introduction of new technologies to be taken account of

(Chan, 2000; Kohli & Devaraj, 2003). This is important for this research as the evaluation commences at the start of MLE pilot and takes the research through a further two iterations to the second year of full implementation. This means that any effects of 'learning and adjustment' (Brynjolfsson, 1993:73) experienced by users and stakeholders to the newly implemented MLE across the University, can be accounted for over the course of the research as it takes time for users to become proficient (Brynjolfsson, 1993: 75).

However, longitudinal research is resource intensive (Kohli & Devaraj, 2003) and has a tendency to cost more, in terms of time and personnel requirements, than other types of research projects (Ruspini, 2002). It is usual for longitudinal research to be carried out just by large research organisations (Ruspini, 2002) but combining this research project with PhD funding has afforded the opportunity for this longitudinal research project to go ahead.

3.4 Philosophical Position

This research is being conducted using the principles of AR, as outlined in the previous section. AR is participatory and requires involvement in the social phenomena being researched in order to gain an understanding of the phenomena to make changes to it. In this case the overall aim of the research is to test the suitability of SSM as an evaluation framework for evaluating the MLE in use, in order to understand the system and to recommend changes, as appropriate. It also has an element of critical reflection whereby the research is refined over time as more knowledge is gained about the situation. Any IS is a constantly changing environment that is evolving over time (Smithson & Hirschheim, 1998) and so this research methodology is designed to assist this process.

An interpretivist approach allows the AR method to rest naturally within the interpretive philosophical framework, where its roots lie (Baskerville & Wood-Harper, 1998; Rose, 1997). The researcher is unable to be separated from the research and the meaning of what is being observed is their own perception. The researcher cannot help but bring their experience and

knowledge to the research and so ‘a priori’ knowledge invariably intrudes upon the observation (Baskerville, 1999).

An interpretivist approach offers a framework for analysis which assists in the understanding and assessment of the meanings assigned by individuals to the phenomena highlighted in the evaluation (Serafeimidis & Smithson, 2000), in this case of the MLE. As has already been discussed, this study is concerned with the social phenomena of the MLE and the meaning that the individual users (social actors) ascribe to it. The users are the staff and students of the university and the MLE is viewed as a social system, not an external object that exists in isolation from human interaction with the system.

An interpretivist approach is also consistent with the philosophical underpinning of SSM due to its assumption that individuals maintain an individual perspective of a system under investigation, dependant on their *Weltanschauung* or world view. Each individual will use the system in the way they see fit, and so broad generalisations about the MLE will not lead to the understanding that is required. In the paradigm debate within the literature review, it was established that generalisations, however, have a role to play in providing information that will allow for high level patterns to be highlighted. It is simply not enough to find that these patterns exist, as the rich variety of individualism that underlies those patterns needs to be understood. By taking an interpretivist viewpoint, this rich layer of detail can be explored and value taken from it to inform the future development of the MLE.

Traditionally, evaluation is seen as an external judgment of an IS which is treated as if it existed in isolation from its human and organisational components and effects (Serafeimidis & Smithson, 2000). Whilst academic researchers in the USA adopt a much more positivistic approach, their European counterparts have challenged the positivistic research community by advocating interpretive and social theory based research (Avgerou, 2000). Many authors have argued that IS evaluation would be improved by using an interpretivist epistemology (Serafeimidis & Smithson, 2000; Avgerou, 2000; Walsham, 1995).

Despite the move towards interpretivist approaches to IS research, the alternate positivist approach still dominates (Crotty, 2005). Indeed, there appears to be a continuous striving from academics and practitioners to develop and adopt better positivist, mechanistic methods to improve the prevailing paradigm (Jones & Hughes, 2001). Quantitative modelling, empirical surveys and laboratory experiments have been almost exclusively considered to be the trustworthy methods of investigation in the field by doctoral researchers as there is a concern that alternative approaches brings a lack of rigor and so the positivist approach continues (Avgerou, 2000).

This situation may be exacerbated in light of dominant patterns of research publication, where the major publications in the field of IS research, such as MIS Quarterly (MISQ), from the start, adopted and continue to adopt a positivistic stance (Chen & Hirschheim, 2004; Avgerou, 2000) with positivist research dominating 81% of all articles published in eight major IS publications in the 10 year period of 1991-2001 (Chen & Hirschheim, 2004). This poses a dilemma for the researcher due to the tension between the political pressure to be published and what they believe to be right. As Walsham (1995) states; researchers live in a ‘publish or perish’ age.

Positivism contributes one piece of the picture but is not rich enough to describe the complex impacts within organisations (Serafeimidis & Smithson, 2000). It does not take into account that evaluation is a socially embedded process in which formal procedures entwine with the informal assessments by which actors make sense of their situation (Serafeimidis & Smithson, 2000). Interpretivism is about the individual social actors’ perception of reality and not the objective view of the scientific observer which makes interpretivism the natural choice for this research project.

So far in this chapter, alternative methodological and philosophical positions have been made explicit and an interpretivist stance had been chosen. Specific attention has been given to understanding the nature of the knowledge that is being generated by this research. The next section deals with how the research will be operationalised. AR is about ‘action’ and ‘research’ and it is these two aspects that the next section concentrates on.

3.5 RESEARCH IN ACTION

3.5.1 Research Context

The research is conducted within the context of a single institution giving the opportunity to understand the evaluation process before deploying the evaluation approach to other institutions in possible future research.

The author of this dissertation is a doctoral researcher at Manchester Metropolitan University (MMU). This has presented the opportunity to use MMU as the institutional setting for this research project over an extended time period.

3.5.2 MLE @ MMU

In 2006, Manchester Metropolitan University took its first steps in establishing an institution-wide Managed Learning Environment (MLE). As of September 2006, MMU entered Phase 1 of a project to roll out an MLE across the whole institution. Phase 1 of the MLE at MMU involved the roll out of the VLE across a selected group of modules involving six out of seven faculties. It included 7,300 students and 364 staff with 830 sections (course websites) created. Phase 2 of the implementation - the addition of a portal - was due to go ahead in September 2008 although this was delayed for a year and so Phase 1 continued up to the end of this research project in September 2009.

The goal of the first phase of the project was to establish a robust, scalable, well-supported and well integrated e-learning environment for all staff and students. The project had 13 work streams dealing with all aspects of the project from ‘Learning and Teaching Planning’ to ‘Help Desk provision’. The work stream that the author was involved in, and forms the focus of this research, was the ‘Evaluation and Audit’ work stream. It is this that will be the focus of the next section.

3.5.3 Evaluation and Audit Work Stream

The requirement of this work stream was to assess best practices of MLE evaluation and decide and act upon appropriate indicators of success. The

aim of this work stream as reported in the project plan was to 'define appropriate indicators of project success and risk exposure and monitor them objectively' (Stubbs, 2006).

The author was charged with carrying out all aspects of the evaluation process from the development of the plan through to the presentation of results. As a result, the author of this dissertation was actively involved in the process of evaluating the MLE at MMU. The way in which this research has been operationalised is the focus of the next section.

3.5.4 Research in Action

In operationalising this research, it was imperative to maintain the correct balance of "action" and "research". The dual cycle proposed by McKay & Marshall (2001) allows the dual aims of making improvements to the practical problematic situation (action) and generating knowledge (research) to work in tandem with one another. These two cycles are referred to as having an interest in 'Problem Solving' (action) and 'Research' (McKay & Marshall, 2001). By making this distinction, the two separate aims of the research receive individual attention (Hardman, 2008).

The two distinct themes of the dual cycle approach were used to differentiate the tenets of this research project; namely the action and the research. This thesis has, where appropriate, been divided into these two themes. This has added clarity to the reporting of this research project where multiple iterations, coupled with the added dimension of praxis, might otherwise bring complexity.

This study was operationalised using an evaluation framework developed by Rose & Haynes (1999) during their evaluation study using SSM in the NHS. Figure 3-2 shows their original framework for evaluating the "RM" system.

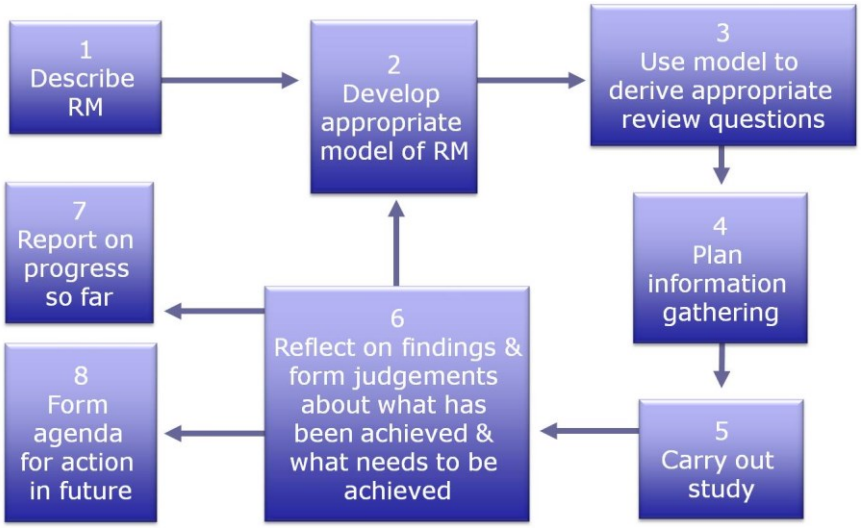


Figure 3-2: A System to Evaluate RM (Rose & Haynes, 1999)

This model forms the basis of both elements of the AR that was undertaken. The steps of this model correlate closely with other models found in AR (see for instance Hult & Lennung, 1980; Susman & Evered, 1978; McKay & Marshall, 2001). It is iterative whereby each iteration allows for a deeper understanding of the system being investigated. The premise of the model is also that each instance of any system will have its own local version (Rose & Haynes, 1999); in this case, each institution would have its own version of an MLE. This suggests the framework is flexible enough to deal with the different interpretations of what an MLE is across UK HEIs. This is important if this framework is to be taken outside of MMU to other UK HEIs.

The real world problem situation for this research was simply how MMU should evaluate its MLE. In carrying out this research the two cycles were looked at separately to distinguish between the practice and research elements. The next section, section 3.5.5, looks at the conceptual element (Research Interest) and section 3.5.6 reviews the practical methodology that was employed (Problem Solving Interest). The model will be revisited in each of these sections.

3.5.5 Research Interest Cycle

The framework as developed by Rose & Haynes (1999) was adapted so that the Research Interest cycle took place on a conceptual level. Figure 3-3

shows the adapted model with the steps that were changed from the original framed in red.

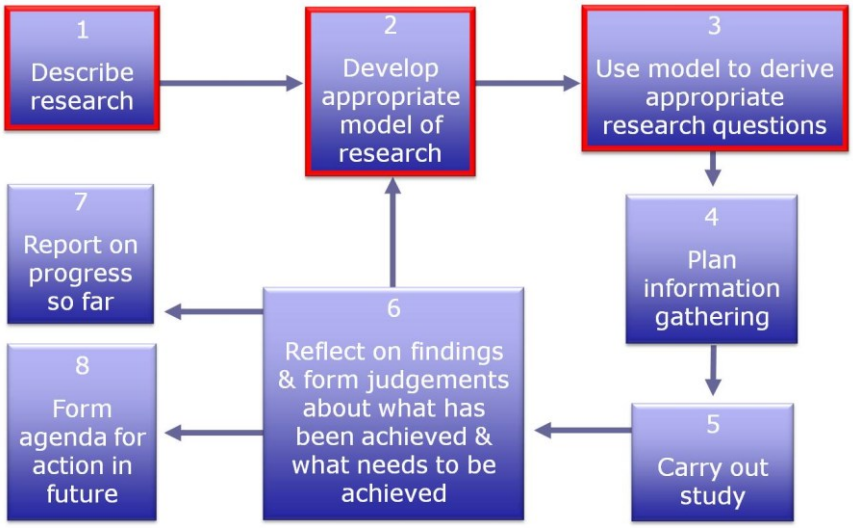


Figure 3-3: Framework for Research Interest (adapted from Rose & Haynes, 1999)

Using this framework for the Research Interest cycle allowed the research questions to be explored in steps 1-3, empirical data collection in step 4 and 5 and reflection and reporting in steps 6-8. This step by step process was followed during the course of this study.

3.5.5.1 Research Interest - Step-By-Step

Step 1 – Describe Research

A rich picture (Checkland & Scholes, 2003) of the research was used to describe the research problem. This allows for a visual representation of the problem situation. According to Checkland & Scholes (2003), pictures are a better means of recording relationships and connections than linear prose.

Step 2 - Develop Appropriate Model of Research

Step 2 focused attention on the literature review and, from this literature review, a root definition of the research was developed. This root definition forms the focus of the whole research project and the issues covered within this thesis.

Step 3 - Use Model to Derive Appropriate Research Questions

From the root definition the research questions were developed.

Step 4 – Plan Information Gathering & Step 5 – Carry Out Study

Operationalisation of the research was addressed in step 4 where the practical aspects of the research, the 'Action', were planned. Step 5 focused on the collection of the empirical data. Both of these steps are covered in section 3.5.6 which deals with the problem solving interest of this research.

Step 6 – Reflect on Findings and Form Judgments About What has Been Achieved and What Needs to be Achieved

Step 6 allowed for reflection on what had been found and to compare results of the 'Action' with the conceptual model that this research is based upon.

Step 7 – Report on Progress So Far and Step 8 – Form Agenda for Action in Future

This thesis is the result of step 7 and step 8 and forms the basis of further research that this topic demands.

In using this framework, the research process had a foundation to guide the theoretical aspects. It also allowed for the separation of the conceptual and the practical. It acknowledges the practical actions that must be taken in order to collect the empirical data that is necessary for new knowledge about the subject under study to be generated. It is this practical element that is dealt with in the next section.

3.5.6 Problem Solving Interest Cycle

The practical evaluation process, highlighted in steps 4 and 5 of the Research Interest cycle, also used the framework from Rose & Haynes (1999). Figure 3-4 shows the model developed by them but adapted for use within the practical context of this research. Again, steps changed from the original have been framed in red.

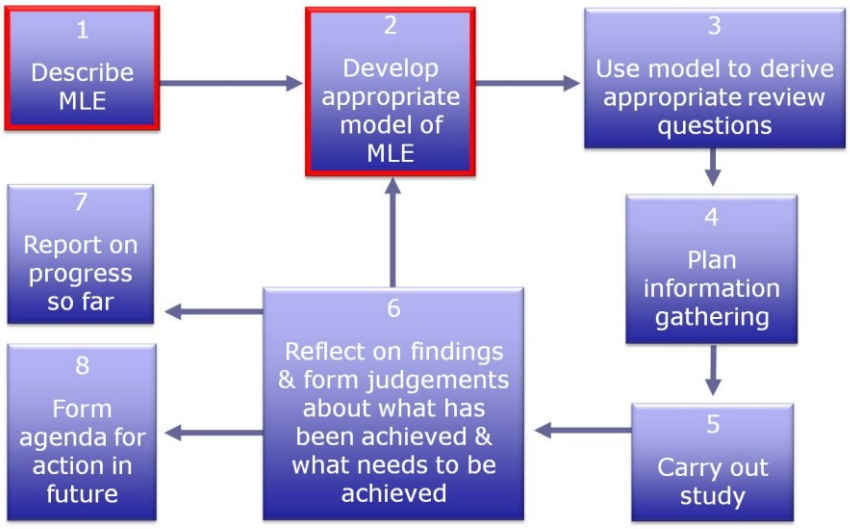


Figure 3-4: Model to Evaluate MLE (adapted from Rose & Haynes, 1999)

The model shows the steps taken in the evaluation process. In working with the model, however, it became apparent that the model did not take adequate account of stakeholder requirements. As previously highlighted in the Literature Review, stakeholders must play an important part in any evaluation study. Therefore the model was adjusted. Figure 3-5 shows the revised model with adjusted steps again framed in red.

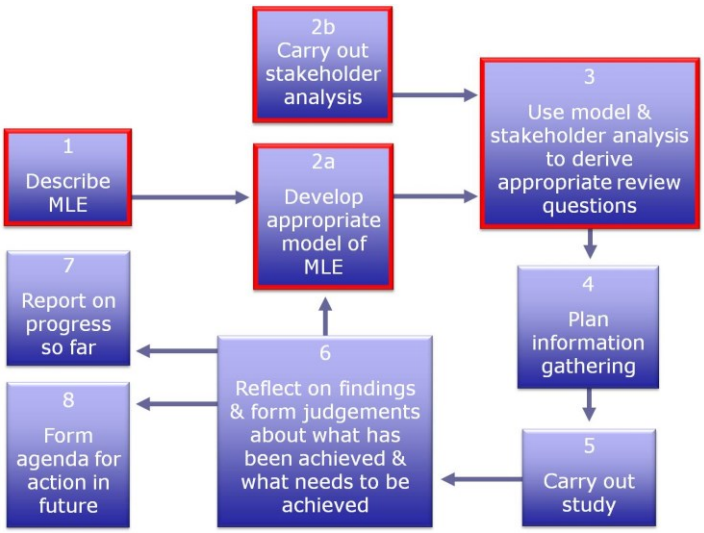


Figure 3-5: Revised Model to Evaluate MLE (adapted from Rose & Haynes, 1999)

The adjustment resulted in an additional sub-step being added at step 2 to take account of the stakeholder analysis. This allowed the stakeholder requirements to be gathered and used to inform the evaluation study. Step 3

was also adjusted to take account of this additional resource from which the review questions for evaluation were derived.

3.5.6.1 Problem Solving Interest – Step-By-Step

The following describes the actions taken at each step. Some of these steps are very detailed as they describe the changes made upon reflection from iteration to iteration.

Step 1 – Describe MLE

A rich picture (Checkland & Scholes, 2003) of the MLE was used to describe Phase 1 of the MLE. This model remained consistent for the whole research project due to the delay in implementing Phase 2. The rich picture allowed for a visual representation of the problem situation as pictures can often be a better means of recording relationships and connections than linear prose (Checkland & Scholes, 2003).

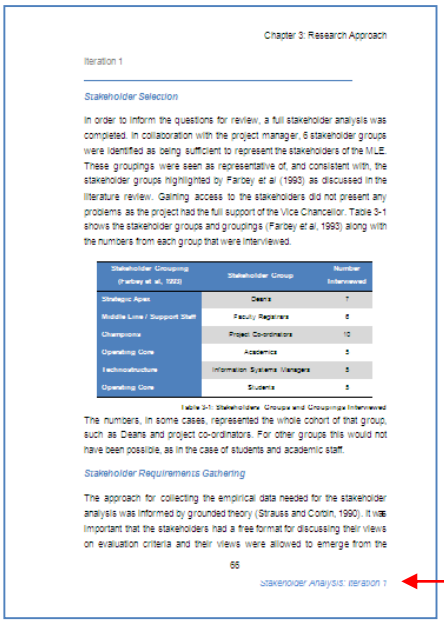
Step 2a – Develop Appropriate Model of MLE

A root definition (Checkland & Scholes, 2003) for Phase 1 of the MLE was developed by the Project Manager and used as the initial model of the MLE. This level of collaboration is completely acceptable within the bounds of this research methodology. Indeed, following findings from the stakeholder analysis, detailed in the next section, the model was refined through subsequent iterations.

Step 2b – Carry out Stakeholder Analysis

In carrying out the stakeholder analysis, different approaches were taken for each iteration following reflection that took place at the end of each cycle. The next three sections assess each iteration separately and detail the methodological approach used. Where the approach changed upon reflection at the end of an iteration, a discussion is included regarding the changes made with justifications as to why.

To assist the reader in keeping track of the iterations, the relevant iteration is made explicit at the foot of each page as shown in Figure 3-6.



Chapter 3: Research Approach

Iteration 1

Stakeholder Selection

In order to inform the questions for review, a full stakeholder analysis was completed. In collaboration with the project manager, 6 stakeholder groups were identified as being sufficient to represent the stakeholders of the MLE. These groupings were seen as representative of, and consistent with, the stakeholder groups highlighted by Farbey et al (1993) as discussed in the literature review. Gaining access to the stakeholders did not present any problems as the project had the full support of the Vice Chancellor. Table 3-1 shows the stakeholder groups and groupings (Farbey et al, 1993) along with the numbers from each group that were interviewed.

Stakeholder Grouping (Farbey et al, 1993)	Stakeholder Group	Number Interviewed
Strategic Apex	Deans	7
Middle Line / Support Staff	Faculty Registrars	6
Champions	Project Co-ordinators	10
Operating Core	Academics	5
Technostructure	Information Systems Managers	5
Operating Core	Students	5

Table 3-1: Stakeholders, Groups and Groupings Interviewed

The numbers, in some cases, represented the whole cohort of that group, such as Deans and project co-ordinators. For other groups this would not have been possible, as in the case of students and academic staff.

Stakeholder Requirements Gathering

The approach for collecting the empirical data needed for the stakeholder analysis was informed by grounded theory (Strauss and Corbin, 1990). It was important that the stakeholders had a free format for discussing their views on evaluation criteria and their views were allowed to emerge from the

66

Stakeholder Analysis: Iteration 1

Details of Current Iteration

Figure 3-6: Navigation Assistance for Stakeholder Analysis Methodology

Stakeholder Selection

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Stakeholder Requirements Gathering

The approach for collecting the empirical data needed for the stakeholder analysis, recognised the importance of the stakeholders needing a free format for discussing their views on evaluation criteria and that their views were allowed to emerge from the discussion. If categories for discussion had been preordained based upon the 5Es (Checkland 1999), there would be a

danger of influencing the stakeholder requirements. This could result in losing the stakeholders' own thoughts and beliefs about the evaluation criteria they thought were important. Therefore, no 'received variables' were incorporated into the interviews so that they did not inhibit or impede the development of the categories for evaluation.

All the interviews were recorded to ensure a complete and accurate record of each conversation. The interviews were unstructured and explored, in the case of all stakeholder groups except students, two specific themes: their conception of what an MLE actually is; and what criteria they felt was important for evaluating the MLE. The first theme was asked to gain an insight into their understanding of an MLE and it prompted a discussion regarding their conception of the MLE at MMU. This was regarded as important as a precursor to the evaluation question as it allowed the interviewer an opportunity to ensure the stakeholder had an understanding of the concept of the MLE before they needed to consider the important evaluation criteria. For students, just the evaluation theme was discussed. At the start of these interviews, the interviewer introduced the students to the concept of an MLE before the evaluation issue was raised. In both cases, the interviewer acknowledging her influence on stakeholders' conceptions of the system are wholly consistent with the philosophical paradigm that underpins this research.

The interviewees were allowed to talk with minimal prompting from the interviewer. Where an interviewee was struggling to think of any criteria they may consider important, the interviewer reminded them of any earlier aspects of the conversation that could help them. Phrases such as..."do you remember when you said x, do you think this may be important for the evaluation to explore?" were used to move the conversation on.

The first iteration of interviewing stakeholders meant that in some instances the stakeholders were being introduced to the concept of an MLE for the first time and, for most, without ever having had any experience of it. With further iterations, once experience has been gained and the conception became more concrete, it was interesting to note the changes in conception and how

this impacts upon the evaluation criteria suggested by the stakeholders. This is discussed further in the second and third iterations.

The data was summarised using a conceptual mapping technique (Swan, 1997). This can be used as a means to represent subjective data in a meaningful way and to act as a tool for facilitating the researcher's desire to understand the thoughts of an individual, group or organisation (Eden, 1992). In the case of this research, it is mapping the stakeholders' thoughts on the evaluation criteria for the MLE. This view of cognitive mapping is the 'weaker view' than the view that cognitive maps are a model of cognition that allow description and prediction of thinking (Eden, 1992).

Mind mapping (Buzan & Buzan, 1993) was used as the conceptual mapping (Swan, 1997) technique. This technique was chosen as it allows themes to be explored in a simple non-linear graphical format. The primary objective of the technique is to cluster related ideas and concepts even though they may arise out of sequence within the interview (Davis et al., 2001). This enables the information to be placed in the most appropriate location regardless of the order of presentation. It also offers a parsimonious and visually powerful representation of interview data (Davis et al., 2001). The information contained within the mind maps was to be presented to the Project Team and the wider stakeholder audience and so needed to be in a readily digestible format.

The mind maps were constructed using a mind mapping software tool, *Freemind* (Freemind, 2011). Using the stakeholders' own words, new trees and branches were created to show the flow of their thoughts and record the various themes that were discussed. The individual mind maps followed the flow of the conversations that took place and did not attempt any classification or categorisation of data. Once constructed, the mind maps were saved into a jpeg format and emailed to each interviewee. This allowed each stakeholder to be participatively involved in the validation of their own maps (Eden, 1992). Conceptual mapping is a useful communication tool for displaying elements of thinking at a given point in time (Eden, 1992). This means that the criteria, raised by stakeholders at the time of the interview,

were displayed in a useful format to facilitate this validation exercise. Even though the research is conducted using an interpretivist approach, the opportunity for interviewee validation was deemed important due to the practical aspects of this research.

Once validation had been completed, individual mind maps were combined to form group maps. Creating these composite maps by merging individual ones allowed for commonly held beliefs to be highlighted, at the same time as those that are idiosyncratic (Scheper & Faber, 1994 cited in Swan, 1997). These created summaries of each group's evaluation criteria. At this point, the data was categorised and individual data collapsed into these categories. Each stakeholder was allocated an identity code. This was for a number of reasons: to protect stakeholder identity; to track stakeholder views across cognitive maps; to ensure integrity of individuals' criteria when categories were re-assembled at a higher level; and to ensure coding reliability when analysing the cognitive maps in order to provide evidence of systematic attention to the dataset when conclusions were being drawn (Huff, 1990). The identity codes allowed for the counting of numbers of stakeholders who believed that a particular criterion was important which allowed the criteria to be ranked in order. This helped the formulation of the Evaluation Plan to represent common views. The identity coding structure is found in Table 3-2.

Stakeholder Group	Identity Code
Academic	a1-a5
Dean	d1-d7
Faculty Secretary	fs1-fs6
Information Systems Manager	ism1-ism5
Project Coordinator	pc1-pc10
Student	s1-s5

Table 3-2: Stakeholder Coding

On completion of group maps, an aggregated map amalgamating all the data was assembled. This created a huge map with over 20 categories. This mass of data was analysed to find categories that could be collapsed into each other to form high level categories, with detailed sub-categories sitting below them. This was done in conjunction with the project manager whereby

keywords and phrases were extracted and used to inform the categories that were eventually arrived at. The final categories were those thought to be most representative of the data collected and allowed the data to be collapsed into a manageable six (Miller, 1956) high level categories. The identity coding structure used was imperative at this stage due to the need to re-categorise data based on the aggregated information and so maintaining reliability of data. The collapsing of categories resulted in the creation of six high level categories with a number of sub-categories.

This amalgamation was a manual process of comparison and cross-checking to ensure that all criteria that had been expressed were represented on the single map. Each stakeholder group was given equal weighting in this process even though some groups held a higher status within the university. The criteria highlighted by each individual / group were also given equal weighting whether they were the first criteria mentioned or the last.

Iteration 2

As has already been discussed, this project is based on an iterative process designed to give a deeper understanding of the system under study with each cycle. A total of three iterations were completed for this research project. Each iteration allowed the evaluation process to be adjusted in line with findings and reflections from previous iterations.

Upon completion of the first iteration, a full reflection occurred and some aspects of the original process where changed. The changes, between the first iteration and the second, are discussed here.

Stakeholder Selection

A number of changes were made to the stakeholder groups between iteration 1 and iteration 2 as shown in Table 3-3.

Stakeholder Grouping (Farbey et al., 1993)	Participants in First Iteration	Participants in Second Iteration
Strategic Apex	Deans	Deans
Middle Line	Faculty Registrars	Faculty Registrars Heads of Department
Champions	Senior Learning and Teaching Fellows (SLTF)	SLTF
Support Staff	Faculty Registrars	Faculty Administrators Library Managers
Technostructure	Information Systems Managers	Information and Communication Technology Services (ICTS) Managers
Operating Core	Academic Staff Students	Academic Staff Students

Table 3-3: Comparison of Representatives of Stakeholder Groups by Category

In the first iteration, Faculty Registrars (FR) were interviewed as both Middle Line and Support Staff. Upon reflection, it was felt that the FRs did not fully represent what was happening 'on the ground'. Therefore, in the second

iteration, for the group 'Support Staff', it was decided to use programme administrators to represent this group. It was also recognised that the library plays an important role in student learning but had not been represented within the first iteration. They therefore were also included within the Support Staff category. FRs continued to be included in the Middle Line category but were joined by the inclusion of Heads of Department. This meant that the two distinct structures within the university were represented at this level; namely academic and administrative functions.

The Technostructure group was formed by the same people in both iterations but the change of name reflects the changing structure to this department during the academic year of 2007-08.

Stakeholder Requirements Gathering

In the second iteration, some changes were made to the original methods employed to collect stakeholder evaluation criteria requirements.

It was felt that the interview process, which was used in the first iteration, was too time consuming. It also led to a large volume of data requiring analysis. This aspect of the evaluation process was therefore looked at closely during reflection of the first iteration.

It was decided that a group approach (Morgan, 1997) to collecting the stakeholder evaluation criteria would improve this process, and ensure a more timely completion. It also made sense to gather data from the whole group at once, as it is the different stakeholder groups' consensus that is important for this research and not the views of individuals within the groups.

It was envisaged that the focus groups would form the primary stakeholder data source and be a self-contained method (Morgan, 1997) whereby no other method would be employed to elicit this data. Focus groups were considered as they are useful when a range of new ideas are important (Morgan, 1997; Krueger & Casey, 2009). They provide data in a less costly and more timely fashion than individual interviews and allow the interviewer to interact directly with the respondents (Stewart & Shamdasani,1990) which

was an important aspect of this research. As Stewart & Shamdasani (1990) point out, this means that the interviewer can respond to the issues raised and probe deeper for clarification. This aspect of the group interviews is wholly appropriate to this research project and perfectly suits the requirements of the data gathering on stakeholder requirements.

However, there are potential disadvantages to using this method of data collection. Dominant individuals may dominate the discussion and hence all participants' voices may not be heard (Stewart & Shamdasani, 1990). Whilst the group interview was taking place, the facilitator invited members who had not spoken for their input in order to help overcome this issue. Also, as with in the first iteration, all the stakeholders were sent the mind map built during the group interview and asked to validate it. This validation exercise assisted in overcoming the issue of dominant individuals as it gave all participants the opportunity to raise further issues post interview.

There may also have been an issue of conformity which could happen if an individual does not express a view that they may have done if the conversation had been private (Morgan, 1997:15). The tendency towards conformity tends to be influenced by how homogenous the group is (Morgan & Krueger, 1993, cited in Morgan, 1997) in terms of social background, education, knowledge and experience (Sim, 1998). The stakeholder groups selected were as far as possible, homogenous. Staff who were of a similar standing within the institution were selected from the different representative groups around the university and levels of staff were not mixed i.e. management were not sitting alongside subordinates. Again, with the validation exercise, individuals had the opportunity to feedback any views they did not raise during the group session.

Overall, the group approach worked very well. Some groups met regularly, and so a slot was secured on the agenda, whilst others were organised without too many issues. However, two groups proved difficult. In arranging these sessions it became apparent that the higher management, namely Deans and Heads of Department, would not be easy groups to accommodate in this way and indeed over time the group option was abandoned and

interviews were used as a last resort. These were then treated in the same way as in the first iteration and mind maps built and amalgamated as before.

Table 3-4 summarises reflection of the two approaches taken within the different iterations and the positives (+) and negatives (-) of each.

Issue	First Iteration	Actual Experience	Second Iteration	Actual Experience
Stakeholder evaluation criteria requirements data collection	Interviews	+	Focus Groups	+
		Easy to arrange one-to-one interviews		Gained group consensus
		-		Time saving for data collection
		Interview process was time consuming		Time saving for analysis of data
		Analysis of data was time consuming		Able to gain greater stakeholder coverage
		Lots of individual data – only interested in group consensus		-
				Difficult to get some groups together

Table 3-4: Summary of Changes by Iteration

In the first two iterations, each physical stakeholder group within MMU are dealt with separately within this process, with separate focus groups held for each of the physical groups. These are mapped to the theoretical groupings identified in the literature review from work by Farbey et al. (1993) and used throughout this process. It was decided however that in order to gain further efficiencies, the library and programme administrators could be amalgamated and one focus group held for these groups. These two groups represent the theoretical grouping of Support Staff and there is no perceived value in holding separate focus groups for these stakeholders. This would not only save time in organising and carrying out the focus groups but would also mean only one mind map would be developed, thus saving time on analysis. This will be taken forward to the final iteration.

Therefore the proposed stakeholder groupings for iteration 3 are found in Table 3-5.

Stakeholder Grouping (Farbey et al., 1993)	Who Second Iteration	Who (Proposed) Third Iteration
Strategic Apex	Deans	Deans
Middle Line	Faculty Registrars Heads of Department	Faculty Registrars Heads of Department
Champions	SLTF CELT	SLTF CELT
Support Staff	Faculty Administrators Library Managers	Faculty Administrators Library Managers
Technostructure	ICTS Managers	ICTS Managers
Operating Core	Academic Staff Students	Academic Staff Students

Table 3-5: Proposed Representatives for Iteration 3 of Stakeholder Groups by Category

One further change that took place in the requirements gathering phase for the second iteration was a change to the mind mapping software. An improved software programme was located, XMind (XMind Ltd, 2011), which had greater functionality than that used in the first iteration.

Stakeholder Numbers

It was found that changes to the data collection instruments for the stakeholder evaluation requirements had a two-fold impact on the second iteration: the number of stakeholders involved; and the data analysis requirements.

As can be seen from Table 3-6, the numbers of stakeholders in the second iteration more than doubled. This was largely due to the change of format as the number of stakeholders within the groups at each session could be extended. There was no longer the restriction of time placed on the number of people it was possible to interview. So, if a group were holding a meeting

and the evaluation criteria became an agenda item, the whole group became involved in the discussion.

Stakeholder Grouping (Farbey et al., 1993)	Number First Iteration	Group Mind Map Numbers	Number Second Iteration	Group Mind Map Numbers
Strategic Apex	7	8	1	1
Middle Line	6 (inc Support Staff)	7	7	4
Champions	10	11	12	3
Support Staff	0 (inc in Middle Line)	0	15	3
Technostructure	5	6	20	1
Operating Core	10	12	22	10
Total	**38**	**44**	**77**	**22**

Table 3-6: Comparison of Stakeholder / Mind Map Numbers Between First and Second Iteration

The number of mind maps built to reach the group mind map has been used as a proxy for the amount of work required to analyse the data. This number decreased by a half in the second iteration. As has already been discussed, in the first iteration mind maps were constructed for each individual. These were amalgamated into group maps before the construction of a whole institution map. For the second iteration, in a number of cases, the group maps were constructed within the focus group and so no further work at group level was required beyond the group meeting.

Overall, the changes to this aspect of the process have deemed to be positive. By changing the process, more stakeholders were involved in the requirements analysis whilst the time requirements of the evaluator has reduced. This is for both gathering and analysing the data.

Iteration 3

The reflections from the second iteration were fed into this third and final iteration of this research project. The changes between the second and final iteration are discussed here.

Stakeholder Selection

All the stakeholder selections were deemed appropriate in the second iteration and so the stakeholder groupings used were carried forward to the third but with the addition of one participant group in the Strategic Apex stakeholder grouping. A Pro-Vice Chancellor with specific responsibilities for the student experience was appointed in June 2008, in time for the start of the third iteration. In collaboration with the project manager, it was decided that he would be an appropriate addition to the stakeholder grouping at that level and so became a representative of this stakeholder group and hence a participant in the research project. The full groupings are shown in Table 3-7.

Stakeholder Grouping (Farbey et al., 1993)	Participants in Second Iteration	Participants in Third Iteration
Strategic Apex	Deans	Pro-VC Student Experience Deans
Middle Line	Faculty Registrars Heads of Department	Faculty Registrars Heads of Department
Champions	Senior Learning and Teaching Fellows (SLTF)	SLTF
Support Staff	Faculty Administrators Library Managers	Faculty Administrators Library Managers
Technostructure	Information and Communication Technology Services (ICTS) Managers	ICTS Managers
Operating Core	Academic Staff Students	Academic Staff Students

Table 3-7: Comparison of Representatives of Stakeholder Groups by Category

Stakeholder Requirements Gathering

The reflection of the changed requirements gathering process, as reported on in iteration 2, found that the changes made were in the main successful. The desired intention in terms of the time saving requirement was achieved and was therefore adopted for this iteration. Due to the problems experienced with some stakeholder group sessions being difficult to organise, it was decided to hold individual interviews, rather than try for group interviews, for these groups; namely all members of the Strategic Apex group and the Heads of Department for the Middle Management group. Table 3-8 shows the stakeholder requirements gathering approach taken by stakeholder groupings for this iteration

Stakeholder Grouping (Farbey et al., 1993)	Participants in Third Iteration	Intended Approach Taken in Third Iteration
Strategic Apex	Pro-VC Student Experience Deans	Individual Interview
Middle Line	Faculty Registrars Heads of Department	Focus Group Individual Interview
Champions	SLTF	Focus Group
Support Staff	Faculty Administrators Library Managers	Focus Group
Technostructure	ICTS Managers	Focus Group
Operating Core	Academic Staff Students	Focus Group

Table 3-8: Stakeholder Requirements Gathering Approach by Stakeholder Groupings

At the end of this iteration, the approach was considered to have worked well. Having adopted the individual interview stance from the start for the management groups as shown, resulted in a more efficient process than trying and failing to gather support for a group interview. Further analysis of this approach, and its potential pitfalls, is conducted within the Analysis and Discussion chapter later in this thesis.

Stakeholder Numbers

The change to the data collection instruments for the stakeholder requirements continued to have the positive effect as experienced in iteration 2. In order to further enhance the efficiencies, it was decided to hold one group interview for three of the groupings; namely Champions, Support Staff, Technostructure, instead of holding one for each of the functions within that group. For example, administrators and library staff were brought together in one group interview in the case of the Support Staff group instead of holding two focus groups as in the previous year. This meant that the numbers of mind maps required reduced further still due to only needing one group map instead of two for the individual groups and then one to amalgamate the groups together. This resulted in the number of stakeholders involved in the process remaining higher than iteration 1 with the amount of data analysis required lower than in either of the previous iterations. A summary of this is found in Table 3-9.

Stakeholder Grouping (Farbey et al., 1993)	Number in First Iteration	Mind Maps	Number in Second Iteration	Mind Maps	Number in Third Iteration	Mind Maps
Strategic Apex	7	8	1	1	2	3
Middle Line	6 (inc Support Staff)	7	7	4	3	4
Champions	10	11	12	3	9	3
Support Staff	0 (inc in Middle Line)	0	15	3	8	1
Technostructure	5	6	20	1	16	1
Operating Core	10	12	22	10	24	5
Total	**38**	**44**	**77**	**22**	**62**	**17**

Table 3-9: A Summary of the Stakeholder Involved and Mind Maps Required

The number of stakeholders varied slightly from the second to the third iteration. This was primarily due to the changing numbers who attend the regular meetings that the researcher was able to 'piggy back' on in order to gather the requirements. The Faculty Registrars are also missing from the

final iteration due to a problem gaining access to this group and so the lower numbers for the Middle Line stakeholder group is reflective of this.

The new categories and sub-categories formed during analysis of the stakeholder requirements from each of the reported iterations were used in the next step; step 3.

Step 3 – Use Model and Stakeholder Analysis to Derive Appropriate Review Questions

This step brought together the model of the MLE and the stakeholder analysis. Cross comparison was undertaken to check issues common to both resources and determine those that were unique. A decision then had to be taken in conjunction with the Project Manager about what the evaluation questions were going to be.

It was decided for the first iteration that a light touch appropriate across all the research criteria that emerged from step 2. The number of criteria used in the first iterations evaluations, 22 in total, did however present problems. It had to be recognised that the evaluation team consisted of just the researcher and so the time required to carry out the evaluations, analyse the data and produce meaningful reports was very limited. This is especially true given the time bound nature of these evaluations needing to be completed within a set timeframe over the summer recess in readiness for a new academic year. Any time out by the researcher potentially had a huge impact on the project.

With this in mind, the decision regarding the evaluation criteria selection in the second iteration needed to take account of these issues. The whole essence of this research project is to find the convergence of ideas about evaluation criteria from the stakeholder perspective and so inclusion of ideas from just one of the stakeholder groups, as happened in the first iteration, does not fulfil this principle for inclusion. It was therefore changed for the second iteration and the criteria for evaluation only included those subcategories raised by three or more stakeholder groups. The reflection at the end of the second iteration confirmed that

the changed process used for deciding upon the evaluation criteria worked well and so was extended to the third iteration. The essence of this aspect of the research was to arrive at criteria important to the majority of stakeholders. Whilst this meant that some criteria were discounted due to a lack of interest across the groups, the criteria that did emerge for evaluation were manageable within the time frame. They also straddled a number of categories which gave a holistic overview to the results.

Step 4 – Plan Information Gathering

The review questions were used to form the Evaluation Plan to be implemented across the university. This plan took into account any current evaluation activities that were on-going by individual members of the MLE research community across the faculties. It also took into account easily accessible data available in database datasets and already, or soon to be, produced documentation. This allowed for gaps in the Evaluation Plan to be highlighted and addressed.

Step 5 - Carry Out Study

The Evaluation Plan, at this point, was operationalised. The evaluation data collection methods, year-on-year, were very much driven by the questions raised in the stakeholder analysis. This means that there was a strong possibility that year-on-year different methods needed to be employed as the criteria change over time.

The data gathering for the evaluation utilised a variety of methods. These included mashups of data held in the VLE database and student record system, online questionnaires for staff and students and focus groups with students. As this aspect of the research project is a secondary issue to the evaluation process a full report is not included here although a brief summary of activities is.

Student Evaluation Data Collection

In the first iteration of this project, all student data used within the evaluation report was secondary data, collected from various projects taking place

within MMU with the relevant data extracted. This was decided on for two reasons: the data sets were readily available; and there was a general consensus that the students were becoming weary of feedback surveys and unit evaluations. It was felt that this approach was adequate for the evaluation requirements of the first iteration, where a light touch approach had been chosen, and the available data answered the questions raised. In the second iteration, however, the level of secondary data required was not available to allow this to happen. This therefore led to inevitable changes to evaluation data collection for students.

For the second iteration, it was decided to run a series of focus groups across each faculty coupled with an online questionnaire. The focus groups allow for a deeper insight into issues the students face whilst using e-learning systems across the university where no standard model, faculty-to-faculty, is used. The questionnaire, on the other hand, was used to look for patterns across the student group as a whole. These data collection methods worked well, in particular the questionnaire. The response rate exceeded all expectations and the information gained was valuable.

Staff Evaluation Data Collection

For staff in the first and second iterations, an online questionnaire was used. The use of the questionnaire as a data collection method for this group was useful as gaining participation from staff has been a difficult aspect to this research.

The results of these instruments can be found in the Results chapter.

Data Analysis

In the first iteration, data was generally analysed using descriptive statistical techniques which was deemed appropriate at that stage of the study. In the second iteration, however, a new approach was taken as a deeper understanding of some of the issues was required. It was recognised that a huge amount of data was available for analysis and simply using descriptive statistics did not answer some of the evaluation questions raised.

The general aim was to coherently make use of data sets available within MMU: namely the VLE and SRS, and extract from them the variables believed to be relevant to student success. The VLE at MMU contains details of every click within the VLE by each user because each activity undertaken by all students and staff is recorded. The VLE data set is a rich repository of student interaction with the learning system, presenting information on e-learning usage patterns, including how often it is used / when / what activities are undertaken, which could be used to highlight the importance of different variables to student outcomes. On the other hand, SRS contains records on all students including socio-demographic data and, importantly for this aspect of the study, data on examination board outcomes: particularly progression to the following year of study or graduation. Because of the role the researcher plays on MMU's MLE project, access to data did not prove to be a problem. Whilst open access was not granted to the SRS database, the data relevant to this study was made available. For VLE data, open access was granted to a reporting database at the end of each academic year.

From each data set, variables were extracted that were believed to be relevant to student progression resulting in a single data set of 'Students' progression-related variables'. A detailed list of the variables considered is presented in Table 3-10. The final variables used for analysis were formed as an aggregation of the millions of rows of data held in the VLE and were brought together with the SRS database.

Because of the magnitude of the data available for an academic year (2007-2008), some 18 variables for 35K students, it was decided to use a classification/decision tree algorithm that is being increasingly used in other disciplines called *Random Forest (RF)* (Breiman, 2001).

Random Forest (RF) Analysis (Breiman, 2001) is a classification method based on the notion of decision trees; it has been widely used across many disciplines for treating large sets of data. Because of the size of the data that was handled, and the desire to develop a predictive model, this was deemed an appropriate method (Hardman et al., 2010). The algorithm was developed at Berkeley, University of California. According to its creator:

'Random Forest are a combination of tree predictors such as that each tree depends on the values of a random vector sampled independently and with the same distribution for all the trees in the forest' Breiman (2001:5)

Variables Used for Analysis	Description	Data Set
Students progression	Students progression as a Boolean variable – yes / no	SRS
Number of learning contexts student registered on	The number of different areas on WebCT Vista that a student is registered on. A learning context can be a unit / course	VLE
Number of active learning contexts student registered on	The number of learning contexts a student has been active on i.e. those units / courses with WebCT usage	VLE
Total number of staff registered on the students learning contexts	The total number of staff registered on all their learning contexts	VLE
First used VLE	The total number of days from the start of term when the student first accessed VLE	VLE
Last used VLE	Total number of days from the start of term when the student last accessed VLE	VLE
Percentage usage between 9am and 9pm	The percentage of individual student's usage between 9am and 9pm	VLE
Percentage usage between 9pm and 9am	The percentage of individual student's usage between 9pm and 9am	VLE
Number of distinct student sessions	Total number of times the student accessed the system	VLE
Number of student documents hits	Total activity for the student in accessing documents and resources	VLE
Number of student chat hits	Total activity for the student in accessing the chat / forum functionality	VLE
Number of student assessment hits	Total activity for the student in accessing the assessment areas	VLE
Total staff documents hits	Total number of staff documents hits for the staff registered on the student learning contexts	VLE
Total staff chat hits	Total number of staff chat hits for the staff registered on the student learning contexts	VLE
Total staff assessments hits	Total number of staff assessments hits for the staff registered on the student learning contexts	VLE

Table 3-10: Student Progression-Related Variables

Essentially the classification method uses decision trees as its basis (Fielding, 2006). The algorithm generates many random trees to form a forest. Trees are random because they use a random subset of the data and a random sample of the predictor variables to generate predictions for cases that were withheld, the so-called Out-Of-Bag (OOB) sample (Fielding, 2006). Consequently, no two trees in a forest are identical. Growing each tree to its largest extent possible, with none of the pruning used in standard decision

trees, helps to keep the bias low. According to Brieman and Cutler (2004, quoted in Fielding, 2006) it has a number of important features:

- they have an accuracy that equals or exceeds many current classifiers and they cannot overfit the data
- they are efficient (fast) on large databases and can handle thousands of predictors without the need for variable selection routines
- they estimate the importance of each predictor
- they generate an unbiased estimate of the generalisation error
- they have robust algorithms to deal with missing data and for balancing the error if class proportions are markedly different
- generated forests can be saved for future use on other data.

Estimating variable importance is one of the RF's most important properties (Fielding, 2006). Variable importance is estimated by determining the percentage increase in prediction error arising from the exclusion of a predictor variable (Fielding, 2006). Thus, predictors with larger values for their importance statistics contribute most to the correct prediction of the class of the OOB cases (Fielding, 2006). In this case, the predicted class is a binary variable (Yes or No) which records a student's progression. The results from this method can be seen in the Results chapter.

Using this method of analysis allowed for a deeper and more appropriate analysis of the data in relation to the impact on achievement and progression. It gave the opportunity to explore the data in a way that the standard data analysis tools do not and so was considered to be a successful addition to the evaluation process.

Step 6 – Reflect on Findings and Form Judgments About What has Been Achieved and What Needs to be Achieved

The reflection of the process of evaluation took place at the end of each academic cycle and formed the basis of this step. The principle aspects reflected upon were the processes involved in gathering stakeholder requirements and the data collection instruments designed to gather the data. Those aspects considered to be successful were taken forward to the

next year and those highlighted as needing adjustment were further reflected upon.

Step 7 – Report on Progress So Far and Step 8 – Form Agenda for Action in Future

Results and progress were reported via pre-designated channels as per the project's agreed communications plan. Further reports were also, where appropriate, communicated to stakeholders. The agenda for the following year was considered, taking account of the reflection from step 6 and lessons learnt to date.

3.5.7 Summary of Research in Action

In summary, the research project was operationalised through a framework which took account of the Research Interest cycle and the Problem Solving Interest cycle. The model used for the research can be found in Figure 3-7 where the different aspects of the research are represented.

A model such as this makes explicit the points at which the research and problem solving cycles converge. In separating out the two factions, each are dealt with separately but recognition is given to the point along the research cycle that the empirical (practical) work is relevant.

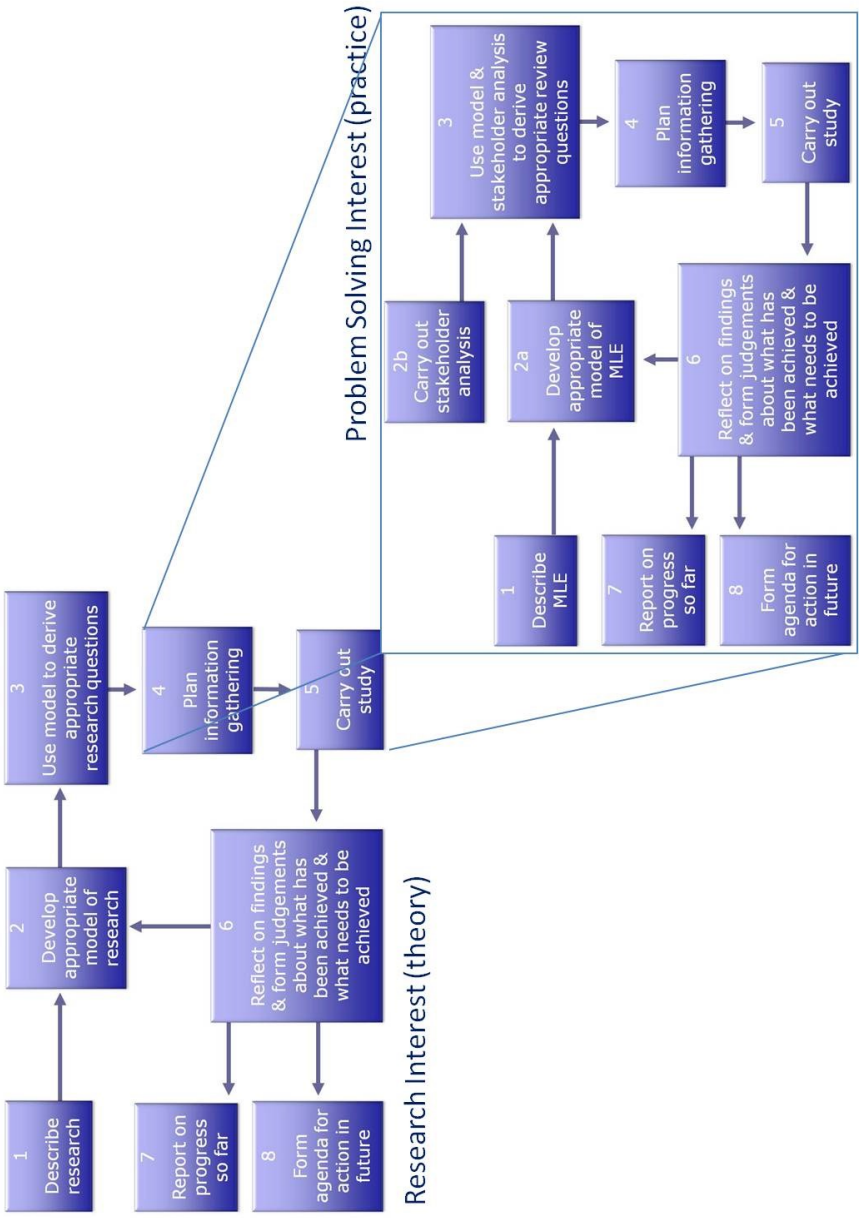


Figure 3-7: Research Model (adapted from Rose & Haynes, 1999)

3.6 LIMITATIONS OF STUDY

Availability of resources, particularly time, is inevitably a limiting factor on research. This study has been conducted solely by the author of this thesis and insights on a system used by tens of thousands of individuals over three years can only ever be partial, particularly when the research is conducted part-time and must be balanced with other obligations.

Fieldwork included pragmatic and innovative responses to the challenges of longitudinal part-time study: for instance, mind-mapping, switching from

interviews to focus groups, and using RF techniques on large datasets. Whilst time limitations affected the volume of evaluation data and analysis activity, explicit attention to the dual cycles of the research process ensured thesis development maintained a clear direction. Inevitable limitations do not appear to have affected the overall perception of the evaluations held by individuals to whom the evaluation results were reported as at the end of each iteration, satisfaction was expressed as to the process followed and results gained.

3.7 SUMMARY

This chapter has looked closely at the context of this research, the methodology employed and the philosophy that underpins that methodology. It has also looked at how the research was operationalised using a framework to assist with both the practical and conceptual aspects. An argument was made for the importance of ensuring that both of these aspects are covered in equal measures to satisfy both the client and the research community. In operationalising the research, a number of issues were highlighted with some forming the basis of further research.

The next chapter looks at the results of this research. These results are both the empirical results that inform the practical aspects of the research (Problem Solving Interest cycle) and output of reflection on the conceptual aspects (Research Interest cycle).

Chapter 4: RESULTS

4.1 CHAPTER SUMMARY

Having explored the research approach for this research project in Chapter 3, this chapter presents the results of the evaluation framework in action. It describes the results for each cycle; the Research Interest cycle and the Problem Solving cycle. Unlike the previous chapter, the results are presented in a linear format and each step of the research approach dealt with thematically.

The Research Interest cycle will be dealt with first and so forms the content of the next section.

4.2 RESULTS OF RESEARCH INTEREST CYCLE

This section details the results found across the three iterations for the research interest cycle. Whilst this research has been conducted across three iterations, the essence of the research project remained unchanged. The results presented for the Research Interest cycle therefore hold true throughout the project.

As a reminder, the Research Interest cycle model, as discussed in Chapter 3 section 3.5.5.1, is shown in Figure 4-1.

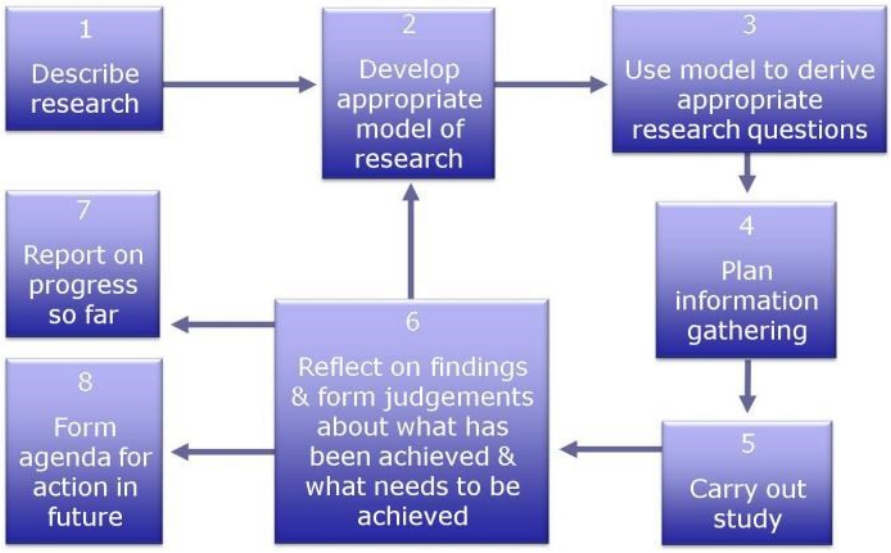


Figure 4-1: Research Interest Model

Using this framework for the Research Interest cycle has allowed the research questions to be explored in steps 1-3, empirical data collection, via the Problem Solving Interest cycle, in steps 4 and 5 and reflection and reporting in steps 6-8. Each of these steps will now be dealt with separately.

Step 1 – Describe Research

The rich picture describing the research problem is shown in Figure 4-2.

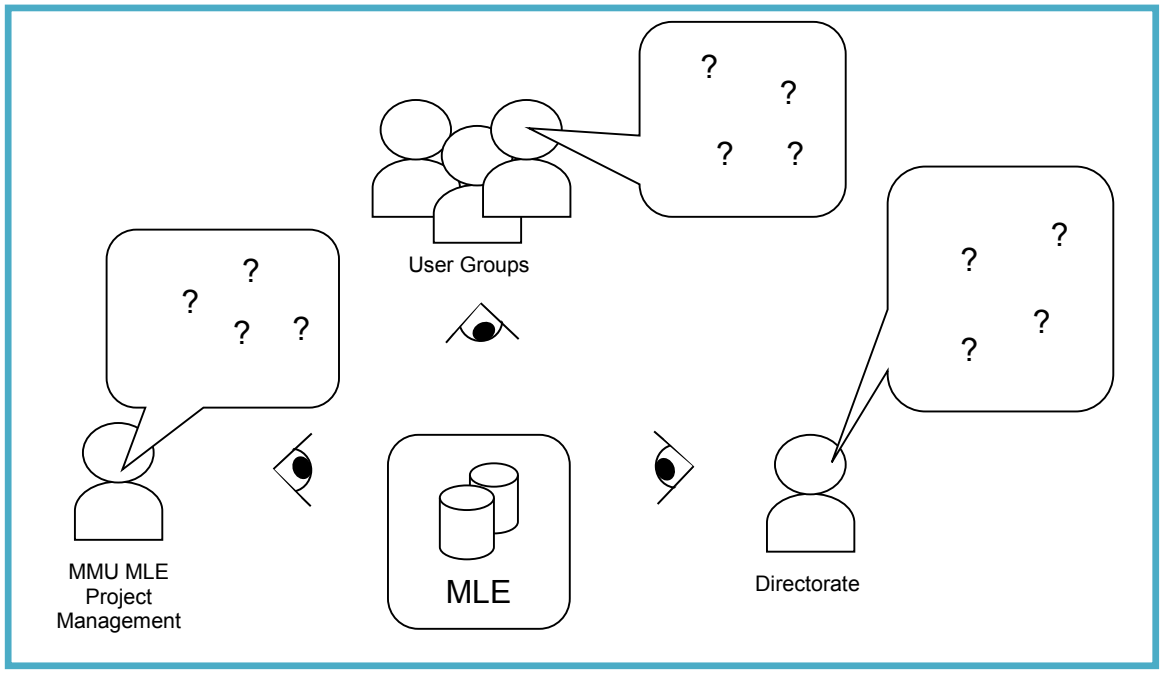


Figure 4-2: Rich Picture of Research Problem

The Rich Picture shows the different groups within the institution having questions about the MLE in situ. These questions are centred around the groups' world view of the MLE in its context within the institution and so the MLE needs to be scrutinised from different angles.

Step 2 - Develop Appropriate Model of Research

The model developed for this research is a working model for the entire research project. Following the literature review, the root definition for this research has been developed as shown in Figure 4-3.

A research project to:

- assess the suitability of SSM for evaluating an institution-wide IS system in use in UK HEIs
- assess the sufficiency of SSM's Measures of Performance contextualised to MLEs in UK HEIs
- assess the Rose & Haynes (1999) model when operationalising the evaluation process in a UK HEI
- assess the value of Farbey et al.'s (1993) stakeholder classification for revealing the range and variety of views necessary for evaluating an MLE in a UK HEI.

By way of:

- longitudinal, multi-method action research in a UK HEI
- conceptually comparing SSM framework with other evaluation approaches
- understanding the criticisms of SSM framework as an approach
- mapping institutional stakeholder groupings to Farbey et al. (1993) framework
- developing a stakeholder analysis process to find out what stakeholders want.

In order to:

- gain knowledge for university
- contribute to knowledge for knowledge community

Figure 4-3: Root Definition of Research

Step 3 - Use Model to Derive Appropriate Research Questions

The immediate research questions derived from the root definition, and discussed in Chapter 2, are:

Research Question 1	How can an institution evaluate its MLE?
Research Question 1a	Can SSM provide a suitable framework for evaluating an MLE?
Research Question 1b	Do the Measures of Performance (5Es) encompass all the evaluation criteria, based on stakeholder expectations, for an MLE in UK HEIs? If not, what adjustment to the Measures of Performance would contextualise them to MLEs in UK HEIs?
Research Question 2	How should stakeholders be identified and what are their evaluation requirements?

As has already been discussed within the methodology chapter, these questions are being explored within a single institutional setting.

Step 4 – Plan Information Gathering & Step 5 – Carry Out Study

Planning the information gathering and carrying out the study was conducted via the Problem Solving Interest cycle and it is at this point that this cycle becomes relevant. Details of the Problem Solving Interest cycle methodology can be found in Chapter 3 with the results of this cycle detailed in section 4.3 of this chapter.

Step 6 – Reflect on Findings and Form Judgments About What has Been Achieved and What Needs to be Achieved

Chapter 5, the discussion chapter, will cover this step in detail.

Step 7 – Report on Progress So Far and Step 8 – Form Agenda for Action in Future

This thesis concludes step 7 and Chapter 7 will specify what further research is recommended as a result of the findings of this research project.

4.3 Results of Problem Solving Interest Cycle

The results of the Problem Solving Interest cycle are included in this section. The practical evaluation took place within the Problem Solving Interest cycle and, like the Research Interest cycle, followed a model adapted from Rose & Haynes (1999) shown in Figure 4-4.

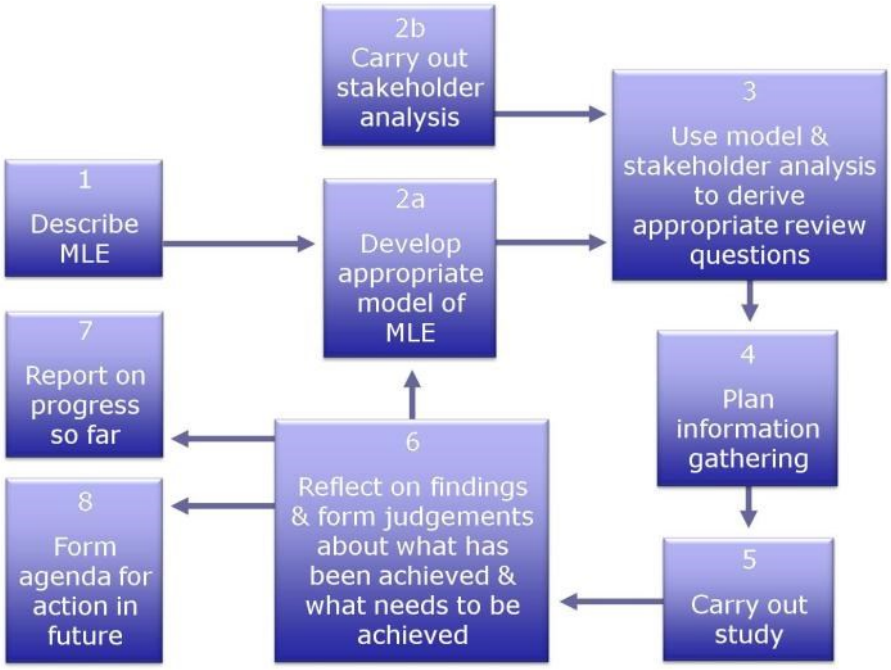


Figure 4-4: Problem Solving Interest Cycle Model (adapted from Rose & Haynes, 1999)

This model was used throughout the 'action' part of this research project and remained unchanged. The results from each of the steps 1 to 8 shown in this model will be discussed in detail for the three iterations throughout the rest of this chapter. Each step of the Problem Solving Interest cycle will be covered in its entirety and present the results of each step thematically.

Step 1 - Describe MLE

The first step in the practical evaluations was to describe the MLE. Figure 4-5 shows the MLE at Phase 1 of the project, the joining of the Student Record System (Curadis) with the VLE in use (WebCT Vista) and represents the places it is possible to access the system from. This description remained the same throughout the lifecycle of this research project at MMU so did not change between iterations.

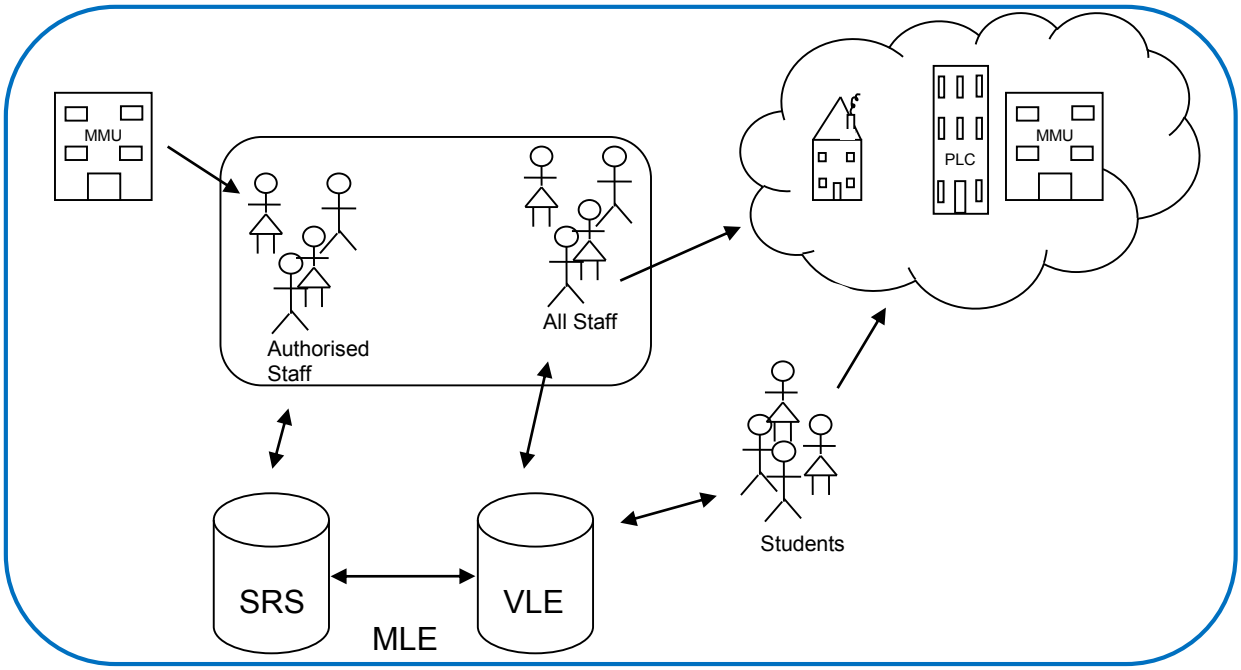


Figure 4-5: Rich Picture of MLE

The project did not however stand still. The major change between iterations was the extent to which departments and faculties within the university began to have a presence on the VLE and therefore more parts of the institution were affected by it.

Academic Year	MLE Phase	Active Staff	% Change Year-on-Year	Active Students	% Change Year-on-Year
0607	Pilot	347	---	8,945	---
0708	Phase 1 Rollout year 1	712	+105%	22,248	+149%
0809	Phase 1 Rollout year 2	905	+27%	31,184	+40%

Table 4-1: Growth of MLE at MMU Over The Term of This Research Project

Table 4-1 shows the growth of the MLE at MMU over the course of the research project. During the pilot phase, only selected departments were invited to take part and so the numbers involved were relatively low. However, there was a dramatic increase experienced at the start of Phase 1 rollout where an open invitation for staff to use the system was made to all faculties and departments. This same open invitation was repeated in the

second year of Phase 1 and resulted in further staff and students becoming active users. As can be seen, student usage grows in line with staff usage. The more staff using the system results in a greater number of student users.

Step 2a – Develop Appropriate Model of MLE

Figure 4-6 shows the root definition of the MLE as it developed through the iterations with the various changes highlighted within the text. This root definition was originally developed by the Project Manager of the MLE Project and is included in the Project Plan as a means of modelling the MLE at MMU. The changes made to the original root definition were in response to the research carried out within this project. A summary of these changes are detailed by iteration.

Iteration 1

Iteration 1 of the root definition includes all aspects found in the root definition in Figure 4-6 except those highlighted in bold.

At the end of the first iteration, it was found that changes needed to be made to the original root definition as a result of the analysis carried out in step 3 of the first iteration. In carrying out the comparison of the stakeholder analysis (Figure 4-10) with the root definition for the project (Figure 4-6) in step 3, it became apparent that the root definition for the project was not flexible enough to cover all stakeholder expectations.

The project model was found to need updating in two places. Firstly, it became clear that there was no provision for reporting on academic and administrative staff engagement or use of the system. This was highlighted as an important area for stakeholders. The students, within the project model, were catered for in point 10 as:

- "providing reports on the use of WebCT Vista that give a meaningful indication of students' engagement with e-Learning"

It was decided that adding staff to this definition would make the statement more inclusive. Therefore the statement was changed to:

- "providing reports on the use of WebCT Vista that give a meaningful indication of **staff and** students' engagement with e-Learning "

Secondly, there was no provision for tracking the needs of stakeholders and the extent to which their needs are fulfilled. This meant that any additional stakeholder requirements were not catered for within the body of the project model. It was decided that an additional point would be propose to be added to the final project model section of 'in order to'. This additional point is:

- Meet and develop expectations of stakeholders for Technology Supported Learning (TSL)

Between the first and second iterations, the Project Board had its annual review and the proposed updates to the root definition were accepted.

Iteration 2

There was a single, minor change proposed to the root definition at the end of the second iteration. The statement concerning the decommissioning of WebCT Campus by 0708, no.4 under the 'how' section, was no longer relevant as this system was, by the start of academic year 0809, no longer in use or being supported. Therefore, this statement was removed for the third iteration and is shown in italics in Figure 4-6. It might be assumed that the statement regarding asset migration would no longer be relevant either due to the demise of WebCT Campus. However, numerous other systems were still in use across the institution that were being run locally. The move to centralising these systems to WebCT Vista had not happened with all faculties and departments and so migration was still an issue for some.

A project

1. operated by LTU, ISU and designated Faculty & Services staff
2. coordinated by the MLE Project Manager, on behalf of the MLE Project Board

to (*do what*):

1. establish a robust, scalable, well-supported and well integrated e-Learning Environment for all staff and students

by (*how*):

1. establishing effective project governance, reporting, document handling, progress monitoring, escalation and team working arrangements
2. establishing effective communication with all project stakeholders
3. establishing a robust and scalable installation of WebCT Vista from June 06
4. *providing system and application administration of WebCT Campus Edition until it is decommissioned in 07/08*
5. including WebCT support within a unified front-line ISU help desk and routing queries to those best placed to help
6. integrating WebCT Vista with MMU systems to provide automated student account provisioning and LDAP authentication from Sept 06
7. disseminating good e-Learning practice and supporting Faculties and Services in achieving it through staged WebCT Vista deployment and the on-going process of setting and realising appropriate e-Learning targets
8. migrating existing assets to WebCT Vista and establishing procedures for managing e-Learning assets that optimise local ownership, reduce duplication and enhance quality and consistency
9. developing staff confidence and competence in using Vista for curriculum innovation and flexible delivery
10. providing reports on the use of WebCT Vista that give a meaningful indication of **staff and** students' engagement with e-Learning
11. identifying, resolving with other stakeholders or escalating where appropriate business process and policy issues surrounding the project
12. evaluating, adopting and monitoring the business case for MLE enhancement tools
13. defining appropriate indicators of project success and risk exposure and monitoring them objectively

in order to (*why*):

1. support a high quality location-independent experience for staff and students that encourages and stimulates independent, autonomous learners
2. increase the flexibility and responsiveness with which faculties can pursue curriculum modernisation and make more innovative use of teaching and learning spaces
3. build capacity within ISU for supporting core, enterprise applications
4. **Meet and develop expectations of stakeholders for Technology Supported Learning (TSL)**

Key: Normal text: Iterations 1, 2 and 3 | **Bold:** Iterations 2 and 3 only | *Italics*: Iterations 1 and 2 only

Figure 4-6: Root Definition of MLE Phase 1: Enterprise VLE (Stubbs, 2006)

Iteration 3

No changes were proposed to the project definition at the end of the third iteration

\Step 2b – Carry out Stakeholder Analysis

Step 2b was a two-stage process.

These stages were:

- gathering stakeholder evaluation criteria expectations and synthesising them using mind mapping techniques.
- from the resultant mind maps, modelling the stakeholder expectations.

These two stages will be dealt with separately.

Gathering Stakeholder Expectations

In the first, and by exception in subsequent iterations, the stakeholder analysis was conducted through a series of interviews, as detailed in Chapter 3, and was carried out in accordance with the methodology discussed. From the recordings of the interviews, mind maps for each individual stakeholder were constructed. Figure 4-7 shows an example of an individual mind map.

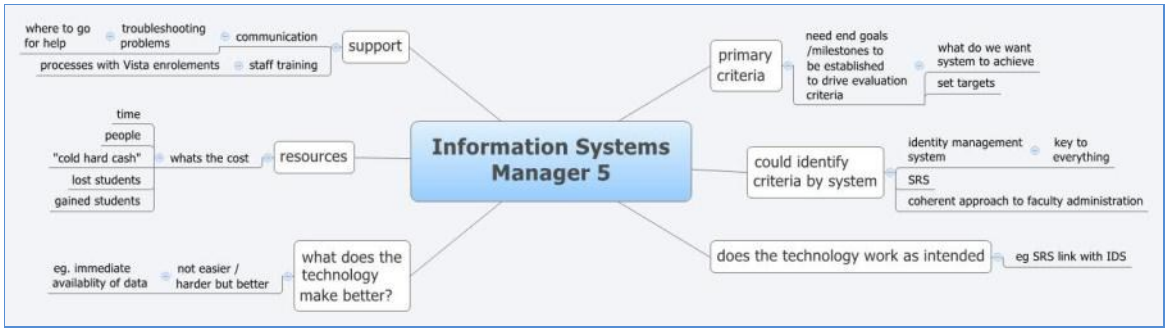


Figure 4-7: Example of Individual Mind Map

From the individual mind maps or group interviews, as carried out in the second and third iterations, a group mind map was assembled as per the classification method detailed in section 3.5.6.1. Figure 4-8 shows an example of a group mind map. All group mind maps can be found in Appendix A.

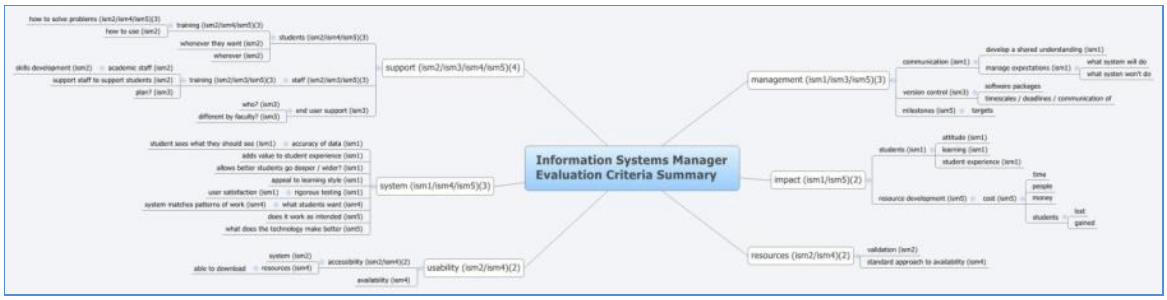


Figure 4-8: Example of Group Mind Map

Figure 4-9 shows and example of an organisation level mind map with the evaluation criteria for the sub-categories collapsed. The organisational maps for each iteration, with all the detail of each subcategory, are too large to show in their complete state within the body of this thesis and so can be found in Appendix A.

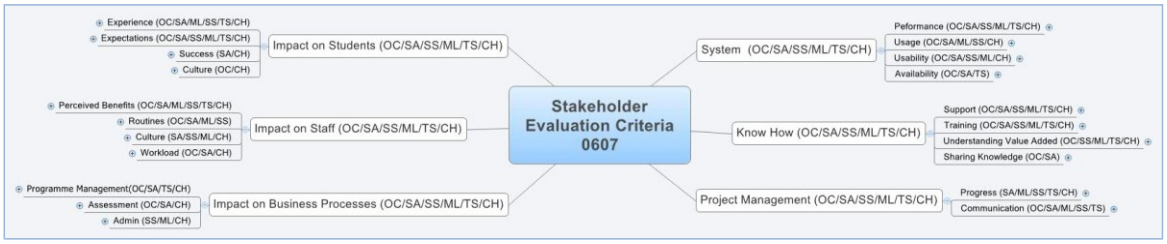


Figure 4-9: Example of Organisational Level Mind Map

From the analysis using mind maps, the organisational stakeholder requirements were modelled. The next section shows the model for this iteration.

Stakeholder Expectations Model

As a result of the organisational level mind map, as found in Figure 4-9, a model was developed showing the stakeholders' evaluation criteria. Figure 4-10 shows the final model, which has been synthesised to show the results for all iterations. The model shows the categories and subcategories found in the organisational mind maps but allows the information to be laid out in an easy to understand format for the project management and stakeholders of the MLE.

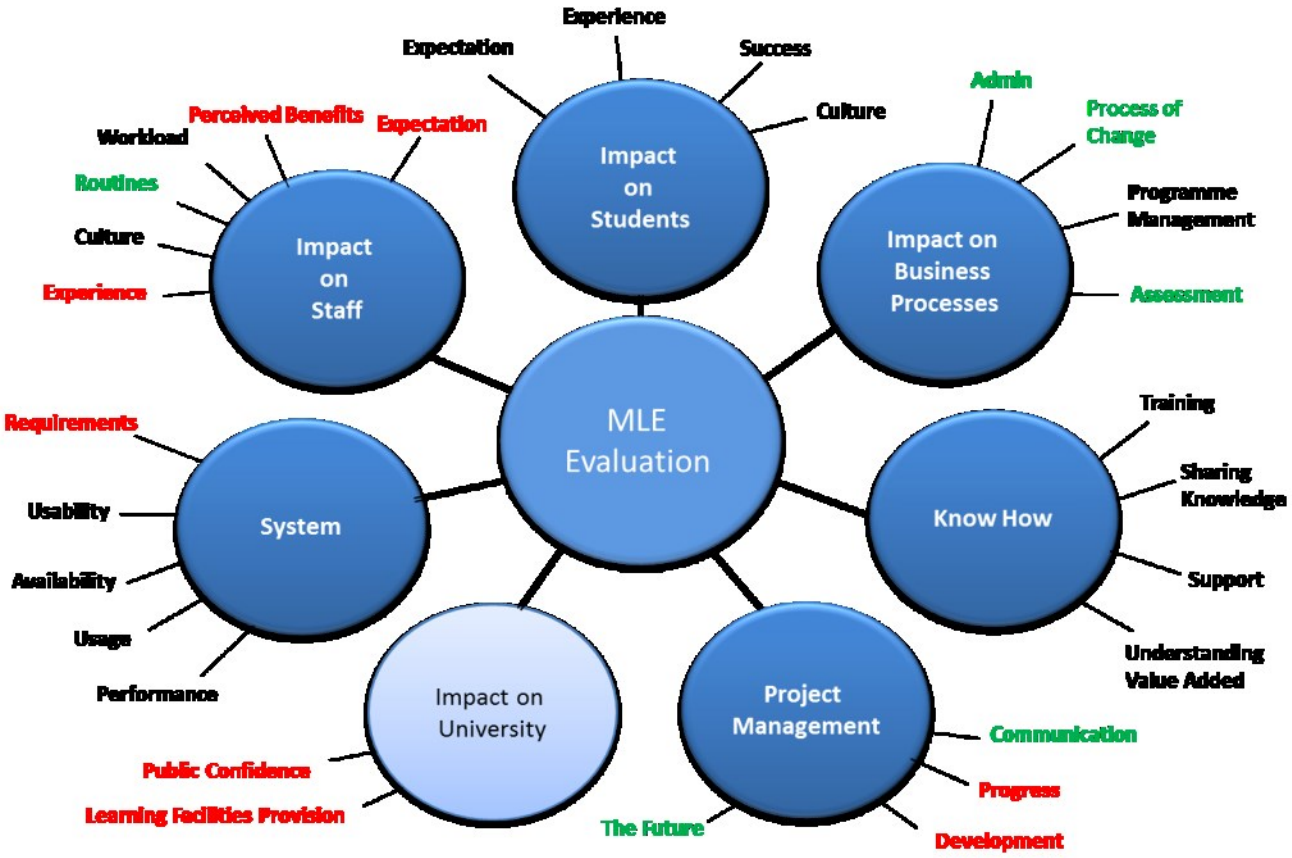


Figure 4-10: Stakeholder Expectation Model Synthesised from All Iterations

As can be seen, the Stakeholder Expectation Model changed between iterations. All high level criteria, except one, appeared in each iteration and are shown in the model in dark blue. The one exception, *Impact on University*, was present in the second iteration only and is shown on the model in light blue. As for the sub-criteria; those that remained consistent across all three iterations are shown in black; those sub-criteria that appear in two iterations are shown in green; and the remaining sub-criteria that

appear just once are shown in red. A full analysis of how the stakeholder models changed is included within Chapter 5 with a discussion about why these changes may have occurred.

The Stakeholder Expectation Model, together with the project model from step 2a, provide a means of informing the next step in the process of evaluation; deriving appropriate review questions. The next section looks at how these questions were reached.

Step 3 – Use Model and Stakeholder Analysis to Derive Appropriate Review Questions

The root definition from step 2a were used to derive the questions for evaluation. The two sets of data were brought together into a single table for each iteration and are shown in Appendix B.

As a result of this comparison of stakeholder expectations with the project model, the evaluation criteria for each iteration were identified. The review questions by iteration are summarised in Table 4-2. The table shows the number of stakeholder groups, out of a possible six, who raised the particular sub-criteria along with an indication of whether the particular sub-criteria was included in the Evaluation plan.

From	Sub-Criteria	Iteration 1 a	1 b	2 a	2 b	3 a	3 b
Stakeholder Analysis	Experience (stu)	6	✓	4	✓	2	✓
	Expectations (stu)	6	✓	4	✓	3	✓
	Culture (stu)	2	✓	1	✓	1	✓
	Success (stu)	2	✓	1	✓	4	✓
	Perceived Benefits (sta)	6	✓				
	Culture (sta)	4	✓	4	✓	2	x
	Routines (sta)	4	✓	3	✓		
	Workload (sta)	3	✓	3	✓	2	x
	Experience (sta)			2	✓		
	Expectation (sta)			1	✓		
	Support (kh)	6	✓	5	✓	4	✓
	Training (kh)	6	✓	4	✓	4	✓
	Understanding value added (kh)	5	✓	1	x	1	x
	Sharing Knowledge (kh)	2	✓	2	x	1	x
	Performance (sys)	6	✓	5	✓	5	✓
	Usage (sys)	5	✓	6	✓	2	✓
	Usability (sys)	5	✓	6	✓	3	✓
	Availability (sys)	3	✓	3	✓	1	✓
	Requirements (sys)					4	✓
	Programme management (ibp)	4	✓	2	x	3	x
	Assessment (ibp)	3	✓			2	x
	Admin (ibp)	3	✓	2	x		
	Change (ibp)			4	x	2	x
	Progress (pm)	5	✓				
	Development (pm)			3	x		
	Communication (pm)	5	✓	1	x		
	Future (pm)					1	x
	Learning facilities provision (uni)			2	x		
	Public confidence (uni)			1	x		
	Asset Migration	0	✓			0	x
Project Model	Project Success / Risk Exposure			0	x		
	Reporting					0	x
	Communication					0	x
	Indicators of success monitoring					0	x

Key: stu=Impact on Students; sta=Impact on Staff; ibp=Impact on Business Processes; kh=Know How; sys=System; pm=Project Management | a = number of stakeholder groups (out of 6); b = included in evaluation plan

Table 4-2: Review Criteria For All Iterations

In the first iteration, it was decided that all the criteria raised by the stakeholders, along with the criteria to emerge from the MLE model, would form the basis of questions for review regardless of the level of interest across the stakeholder groups.

In the second and third iterations, it was decided not to include all of the criteria that emerged from step 2 of the evaluation process in line with the reflections at the end of iteration 1. This was due to the huge resource commitment required to carry out the evaluations and subsequent analysis. It was therefore decided to select criteria where:

1) convergence of stakeholder requirements occurred with three or more groups
2) it was considered possible to collect the data required in a timely fashion
3) the data collection methods required for those criteria with interest from less than three stakeholder groups, were already being utilised to gather the data required for the criteria within point 1 above and would therefore mean no any additional effort in collecting the data was required

The evaluation plans as a result of this step were developed in the next step.

Step 4 – Plan Information Gathering

As a result of the review carried out in the previous step, the Evaluation Plan for each iteration was developed. The three evaluation plans can be seen in Figure 4-11, Figure 4-12 and Figure 4-13. Full page versions of these plans can be found in Appendix C.

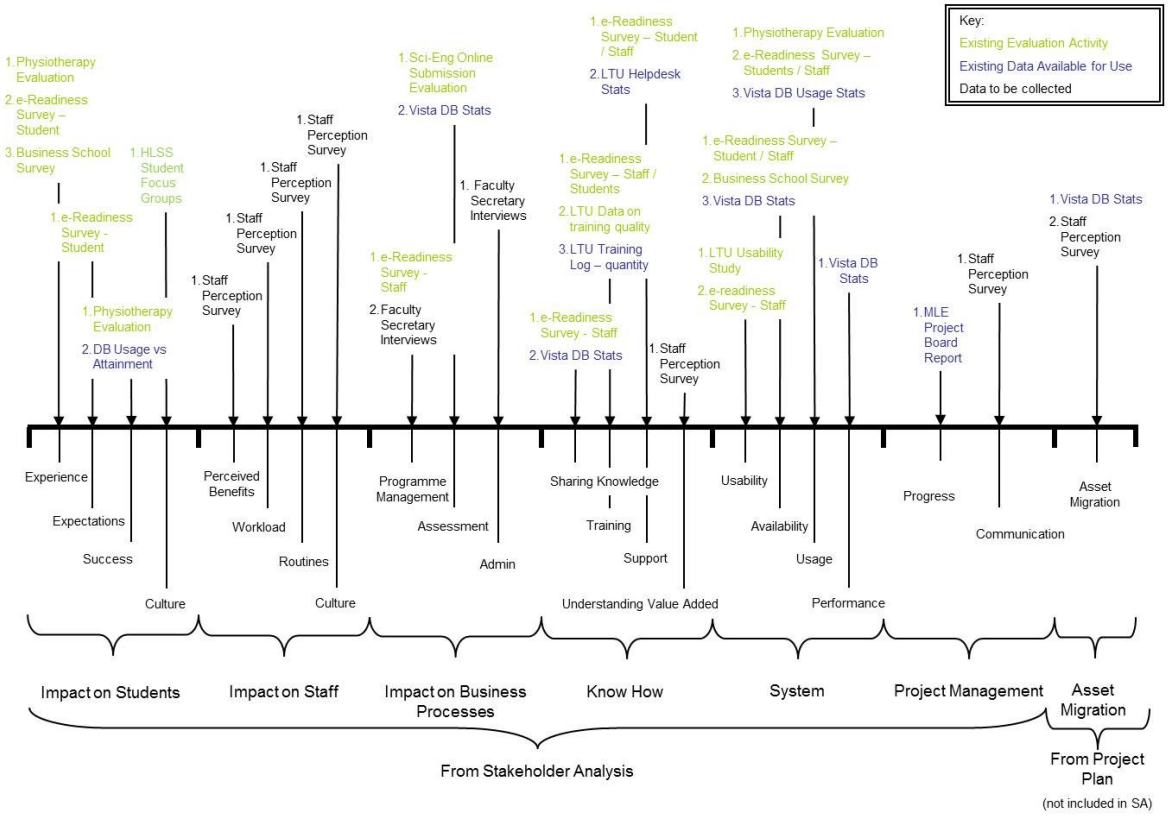


Figure 4-11: Evaluation Plan 0607

For Iteration 1, all existing evaluation activity across the university was allowed for and highlighted within the plan. The plan also shows the data which was easily accessible through existing database datasets and readily available, or soon to be produced, information. Finally, the gaps were highlighted and show where empirical data was to be collected by the evaluation team.

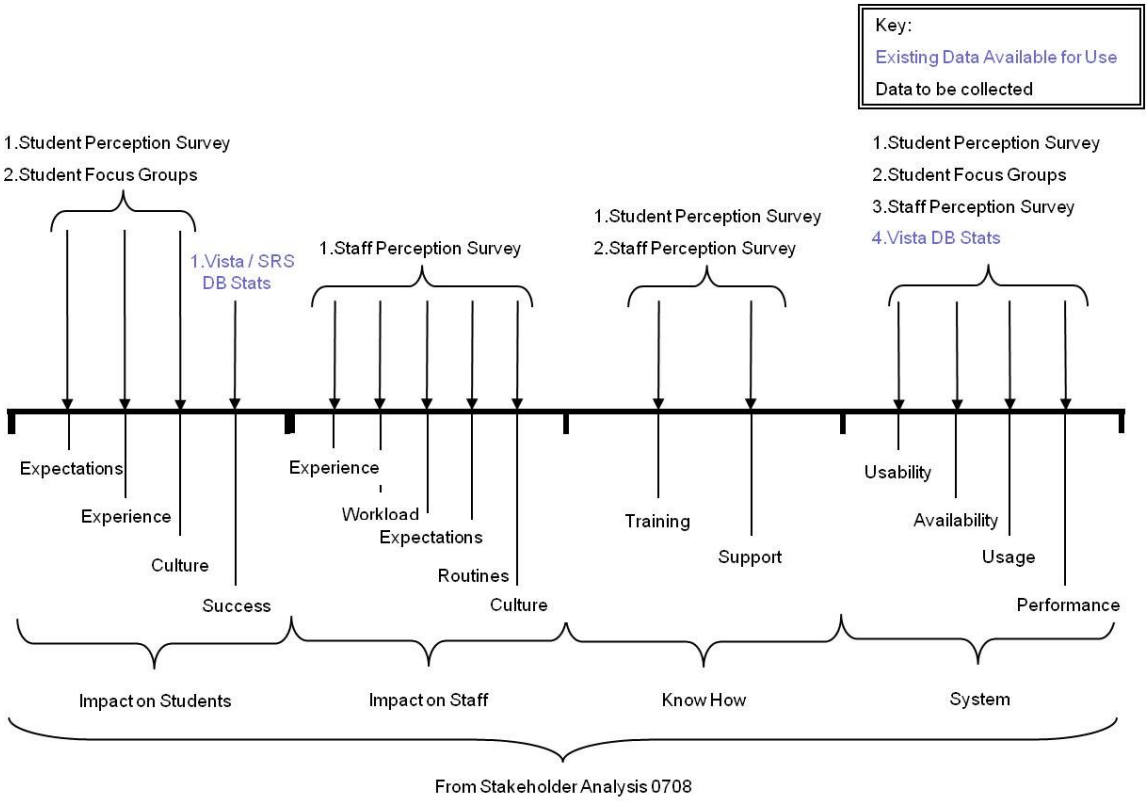


Figure 4-12: Evaluation Plan 0708

The Evaluation Plan for the second Iteration, 0708, is shown in Figure 4-12 and, as previously stated, does not include all sub-criteria from step 3. As can be seen, the majority of data was collected via staff and student surveys and student focus groups. This was primarily due to the lack of other projects around the university which collected the data needed to fulfil the stakeholder requirements.

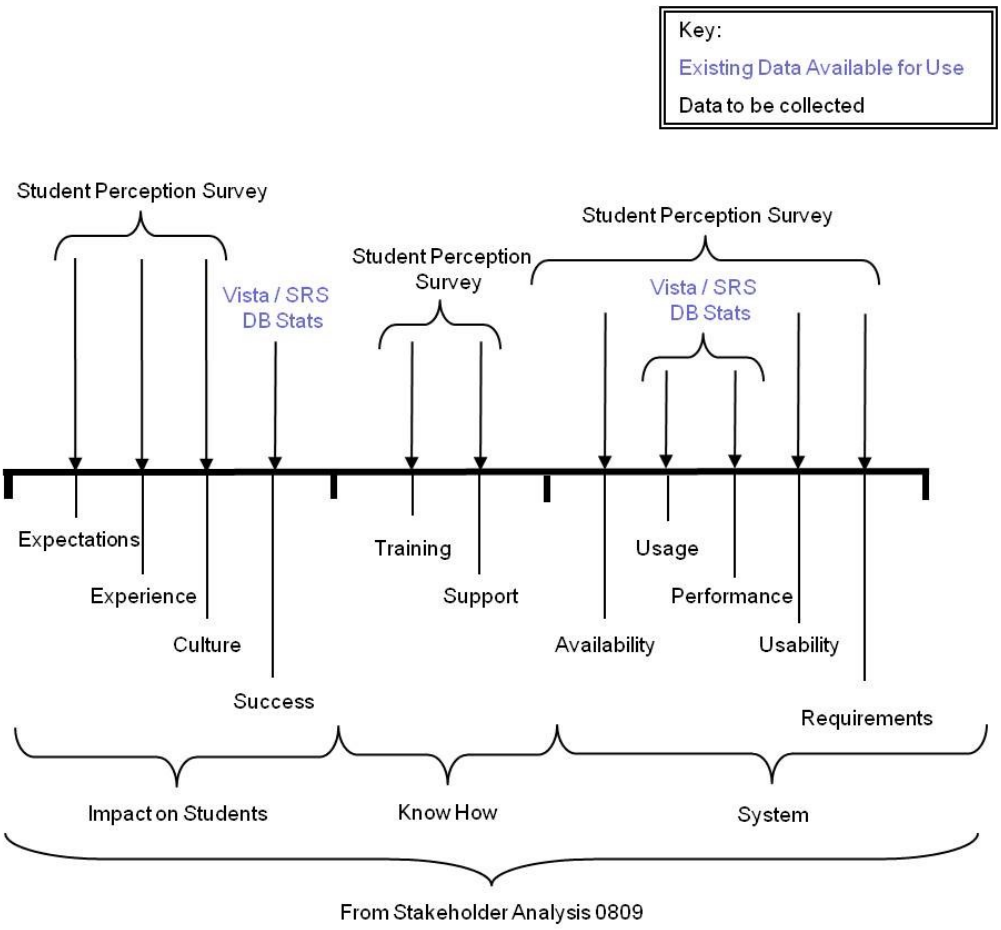


Figure 4-13: Evaluation Plan 0809

The plan for Iteration 3 can be found in Figure 4-13. Due to a resource issue, there was only time to develop one empirical collection instrument for this final iteration and so it was decided the students would be the focus. Therefore, an online survey was devised to collect the data from students. This followed a similar format to the previous year which would allow for some longitudinal benefits. Database interrogation, as in previous years, was also used.

Step 5 – Carry Out Study

The evaluation plan for each iteration was executed according to the plan laid out in step 4 and the results by iteration are summarised here. The results are presented by iteration.

Iteration 1

The data in this first iteration was compiled from a number of sources. The sources can be found in Table 4-3. Please note: the 'HLSS Student Focus Groups' and 'Faculty Registrar Interviews' included in the Evaluation Plan, found in Figure 4-11, did not go ahead due to unforeseen circumstances and so is not included in the data sources table.

ID	Description	Sample Size	Methodology
1	E-Readiness Survey – Staff	42	Questionnaire
2	E-Readiness Survey – Students	209	Questionnaire
3	Staff Perception Survey	82	Online Questionnaire (Appendix D)
4	Physiotherapy Evaluations	87	Questionnaire / WebCT Tracking Data / Academic Achievement Data
5	Learning and Teaching Unit Training Log	330	Log
6	Learning and Teaching Training Quality Survey	27	Questionnaire
7	Vista Database Data	4,000+	Various Statistical Methods
8	Business School Survey	2,700+	Online Questionnaire
9	Sci-Eng Online Submission Evaluation	Not Known	Open faculty workshops

Table 4-3: Evaluation Data Sources 0607

A summary of headline results for 0607 evaluations is presented here. It was not considered necessary to present more detail as the results are not the primary focus for this thesis. The evaluation headlines from these sources for 0607 are as follows:

Impact on Students

- Students like the flexibility (time, convenience, re-visiting content, working at own pace) afforded by the VLE and feel it helps them to study. They did, however, report concerns regarding accessibility (login problems) and lack of competence / confidence in using computers.
- Students reported that they would like to see more use of the online features afford by the VLE and they would choose a course that offers a combination of classroom learning supported by technology.

- There is a positive relationship between using the VLE and student attainment for first year students. In physiotherapy, the students achieving the highest grades were also the highest users of the VLE.

Impact on Staff

- The majority of staff felt the use of the VLE had increased their workload. This increase mainly was experienced around the development of resources and using the technology. There were time savings made principally in business processes such as photocopying and assessment management. Most staff spent less than three hours per week maintaining and updating their VLE area and developing new material with the majority spending less than an hour per week using the VLE as a communication tool.
- Staff felt the VLE made communication easier along with the flexibility it afforded to Learning and Teaching with some staff perceiving that the L&T process had changed. Staff did, however, feel that the choice of software / technology in use made things harder for them.
- Staff felt that the VLE helped them manage their modules more effectively with a better overview and helped them keep things up to date. They felt satisfied with the VLE with some staff reporting that it had enhanced their staff experience. They also thought it had allowed for new opportunities to be explored. Most staff did however say that it had not exceeded their expectations of a VLE.
- Staff believe the VLE improves communication with students although less than half believed it improved collaboration with colleagues.

Impact on Business Processes

- Staff reported their departments were making a concerted effort to integrate some aspects of e-learning into their programmes with reports of their department promoting good practice and innovation in e-learning. They also reported that at least one departmental wide project or initiative was being developed.

System

- There is a positive relationship between staff use of the VLE and student use.
- Students are using all aspects of online technology including VLE, library catalogue and e-books / e-journals. There is a wide range of active user time from less than 2 mins up

to 58 hours. Almost all students have access to an internet enabled computer off campus with the majority having access to broadband.

- The majority of Staff reported that they logged on to the VLE at least once a week accessing it both on and off campus. They use the VLE for at least two modules with the intention of increasing their usage and the number of features they use in the coming year.
- Most activity took place in the first term with document delivery and calendar / announcements being the most popular activities.

Know How

- Staff generally reported the availability of local and centrally available support for the VLE. However, only a small number reported that there is departmental support for students.
- 773 hours of training were recorded with a total of 330 attendees
- Most staff report having had some training with almost all having attended the introductory course. The majority of staff did believe that they needed further training particularly in the areas of content and student management and using templates. The vast majority of staff reported that the training session met their individual needs and that the supporting materials were useful.
- There was some knowledge sharing reported but this was in the minority.

Asset Migration

- Most staff had some resources in an alternative VLE that they would have liked to move across with some reporting having moved them without any problems although quite a number of these needed assistance in doing so.

Iteration 2

The Evaluation Plan was executed according to the plan laid out in step 4. The data in this first iteration was compiled from a number of sources. The sources can be found in Table 4-4.

ID	Description	Sample Size	Methodology
1	Online E-Learning Survey - Staff	65	Questionnaire (Appendix D)
2	Online E-Learning Survey – Students	653	Questionnaire (Appendix D)
3	Focus Groups - Students	47	Focus Groups
4	Vista Database Data	18,000+	Various Statistical Methods

Table 4-4: Evaluation Data Sources 0708

The headlines for the 0708 evaluations are as follows:

Impact on Students

- Students generally happy with the concept of e-learning to support face-to-face teaching but not to replace it.
- 72% of students reported that e-learning helps them with their learning although less than half thought it improved their student experience.
- Only 2% of students reported being unhappy with the concept of using e-learning systems with 41% of all students surveyed saying Vista met their expectations.
- Where no e-learning systems were in use, students did not perceive it as being important to them in their studies.
- Greater contact with academics was reported where some form of online learning system was in use.
- Where e-learning resources were made available the impact on learning / achievement was positive especially when coupled with an active discussion forum.
- When in use, students felt discussion forums assisted their learning due to interaction with other students and ability to look at others' questions / answers.
- Students liked the flexibility of accessing information 24/7 and felt it especially helped them when they were undertaking revision.

- Students would like to see lecture materials (prior to lecture), notices and links to external resources. Some also spoke of past exam papers, grades and timetable information.
- Nobody reported that their e-learning areas lived up to their expectation with very few modules giving access to this type of material.
- All students reported a desire to see consistency of use by staff with regards to content although nobody reported that consistency expectations were met. Promised content was not always delivered.
- Some students were satisfied but many were not - satisfaction came from those students who used a single system.
- Students reported a positive impact on the students experience when it was used 'properly'.
- Lack of resources online has led to frustration.
- Many reported navigation / usability issues with Vista which affected their experience.

Impact on Staff

- More than two-thirds of staff believe WebCT Vista has increased their workload, the same as last year, with 85% reporting not having any allowance in their timetable to allow for this.
- The increased workload was generally in the development of resources to use online.
- Staff believed that by using WebCT Vista, "paper shuffling" has decreased i.e. photocopying lecture notes as hand outs.
- Whilst staff generally feel e-learning has a benefit in course management and feel it affords them new opportunities to be explored, they are less convinced about the benefits to student learning and achievement and are hesitant about WebCT Vista as an e-learning tool to match their expectations and enhance their staff experience.
- 43% of staff reported not using the e-learning on any of their courses although only 20% stated they were unhappy to use WebCT Vista in their teaching.
- Staff generally found communication with students easier through the dissemination of materials.
- Some staff reported that managing student expectations was more difficult as the expectation for the availability of resources online was greater which put more pressure on staff.

- Whilst some staff reported an improvement in their role with the use of WebCT Vista (better communication / more flexibility / course management easier / improved pass rates / more professional) other colleagues felt it had a negative effect on their role (less satisfying than face to face / more tied to a computer / role made more complicated).

Know How

- The majority of students reported finding WebCT Vista easy to use although about a third felt they would like some training.
- Less than 10% of students reported being dissatisfied with the support they received with WebCT Vista this year although the majority of students ask their friends for help should they need it.
- Most staff felt WebCT Vista was fairly easy to use although two-thirds of staff felt they needed more training.
- More than half the staff reported satisfaction with the support they receive for WebCT Vista.

System

- Students who predominantly use the system between 9am and 9pm are more likely to progress to the next level of their studies reaching a peak ratio of around 90% daytime: 10% night time to maximise potential.
- The later in the academic year the student last uses the system, the more likely they are to progress.
- The higher the resource activity of staff in an e-learning area, the lower the probability of student progression.
- Over 90% of students have convenient, consistent, reliable access to an internet-connected PC off campus.
- Student report being extremely confident in all aspects of PC use.
- WebCT Vista was reported as a stand-alone system or part of a combination of multiple e-learning systems in use within faculties coupled with WebCT Campus, local intranets or common drives.
- A lack of resources available online resulted in a lack of use by students.
- Many students reported navigation / usability issues with Vista.

- More than 80% of staff spent less than three hours per week maintaining and updating their VLE area and developing new material with two-thirds of staff spending less than an hour per week using the VLE as a communication tool.
- Staff also reported problems with WebCT Vista's usability, which has been described as "clunky".
- A small number of staff reported performance issues where the software did not work properly i.e. Java issues.

Iteration 3

The Evaluation Plan was executed according to the plan laid out in step 4. The data in this first iteration was compiled from a number of sources. The sources can be found in Table 4-5.

ID	Description	Sample Size	Methodology
1	Online E-Learning Survey - Students	1,156	Questionnaire (Appendix D)
2	Vista Database Data	18,000+	Various Statistical Methods

Table 4-5: Evaluation Data Sources 0809

The headlines for 0809 are as follows:

Impact on Students

- Around 90% of students are happy with the concept of using e-learning as part of their studies with the principal reason for those unhappy with e-learning being they prefer face to face contact with their tutor.
- Whilst over 70% of students would like to see consistent content across all their courses only a third of student reported that this was being achieved.
- Students are less worried about a consistent layout with around half wanting this. Again around half reported having a consistent layout.
- When layout or content is not consistent, students reported a negative effect on their studies i.e. difficulties finding resources / confusion.
- Students stated that their preferred method of communication is text message.

Know How

- Less than 10% of students found WebCT Vista difficult to use with less than 15% feeling they need some training.
- Over 80% of students were satisfied with the support they received although one quarter of students reported needing support as they could not 'see' all their units in WebCT Vista and the same number reported having access problems.
- As in previous years, the students' main source of support was their friends.

System

- The later in the academic year the student last uses the system, the more likely they are to progress.
- The higher the number of resources available in an e-learning area, the lower the probability of student progression.
- 88% of students reported using WebCT Vista in their studies with 50% of students reporting some use on all their courses.
- A third of students had problems using WebCT Vista. The majority of problems were reported as: slow loading of content; login problems; Java problems; session timeouts.

Step 6 – Reflect on Findings & Form Judgements About What has Been Achieved & What Needs to be Achieved

The reflection on the different aspects of the evaluation process, in terms of what was achieved and what needs to be achieved, is detailed in Chapter 3 and so will not be repeated here. The following reflects on the findings of the evaluations from each iteration.

Iteration 1

Overall, the MLE was seen as a useful addition to the learning and teaching toolkit. For students, they liked the flexibility this afforded them and the convenience of a system available 24/7. They also felt it helped them with their learning. Staff, whilst recognising some benefits to a system such as

this, were less convinced about its value as a learning tool. Both sets of users complained about its usability and performance in terms of reliability.

Iteration 2

The findings show that students like the flexibility that the e-learning system affords them. The 24/7 nature of a system such as this means they can choose when and where they access their learning and this can be at a time that best suits them. They do not have a problem with which system they use, only that the staff use it and they use it in a consistent way. Student progression appears to be closely linked with: the time of day a student predominantly uses the system; the later in the term that a student uses the system; and the amount of activity staff have in providing resources to the student.

Staff recognise some of the benefits to a system such as this but do not like the interface in use. The VLE to the staff is the interface by which they currently access the MLE due to the VLE-integrated MLE in use at MMU in this iteration.

Iteration 3

The vast majority of students, as previously found, are happy with the concept of e-learning and are happy to use it as part of their studies. Consistency of content, and to a lesser extent layout, was seen as important but not met which led to negative effects on their studies. Most students are happy with using the system and the support they receive although, as previously found, most of the support they receive comes from their friends.

A high proportion of students reported using WebCT Vista and it was found that those who use it right up to the end of the academic year are most likely to succeed in their studies. Again it was found that higher levels of staff activity around resources in WebCT Vista resulted in a negative impact on progression. Problems with WebCT Vista were again reported by students.

Step 7 – Report on Progress So Far

The project structure provides channels for reporting the outcomes of evaluation work. The findings for each iteration were shared with the MLE Project Board at the annual MLE board meeting. The findings for the second iteration were also shared with the Academic Development Committee, MMU's most senior committee for initiating and tracking academic developments.

Step 8 – Form Agenda for Action in Future

The researcher and MLE Project Board were satisfied that the evaluations elicited important, worthwhile information about the MLE in situ. The agenda for the each iteration was to continue the evaluation process, taking account of the reflection on the findings.

In summary, the action plans for the evaluation process for each iteration were:

Iteration 1

- Adopt a focus group approach to the stakeholder requirements gathering process
- Adjust the stakeholder groups in line with the reflections
- Alter the decision making process regarding which criteria will be included in the evaluations.

Iteration 2

- Utilise the pragmatic approach to stakeholder data collection used in the second iteration by firstly attempting to gather data via focus groups recognising the difficulties experienced with some groups and so adopting interviews for these

- Continue with the reasoning for deciding which criteria for evaluation are used. These were:

1) convergence of stakeholder requirements occurred with three or more groups
2) it was considered possible to collect the data required in a timely fashion
3) the data collection methods required for those criteria with interest from less than three stakeholder groups, were already being utilised to gather the data required for the criteria within point 1 above and would therefore mean no any additional effort was required.

Iteration 3

- Continue utilising the pragmatic approach to data collection for gathering stakeholder requirements with particular recognition of those groups unsuited to group interviews
- Continue with the logic for criteria selection for evaluation
- Further develop the analysis methods in order to provide detailed analysis of unexpected high level relationships, such as the issue surrounding staff activity in resources negatively affecting student progression.

The research project was a three-year project and only the evaluations over this period are included in this thesis. Therefore the action plan for Iteration 3 are what would have been carried forward were the research to have continued.

4.3.1 Summary of Problem Solving Interest Cycle Results

The problem solving cycle presented summary evaluation results from each iteration for illustrative purposes. The wealth of data from a project such as this can be overwhelming and so summaries are helpful in showing the high level data found. The evaluation process changed markedly from the first iteration to the second but less so for the third. The lessons learnt from each iteration were taken forward and it was found that many of the processes adopted in the second iteration were carried forward to the third due to their success in the context of these evaluations.

The summary evaluation results showed that:

- the later in a year a student continues to access the VLE, the more likely they are to progress
- students who use the VLE during the day (9am to 9pm) are more likely to progress
- the probability of student progression reduces as more documents are added to the VLE
- the vast majority of students are happy with e-learning due to the flexibility it affords them
- the ones who are unhappy tend to have a preference for face-to-face contact
- most students feel that e-learning helps them with their studies
- students like consistency of content and layout in their VLE areas, with content being considered the most important
- most staff are concerned about the increase to their workload brought about by the use of the VLE due to the time taken in development of online resources
- many staff report being unhappy with the VLE in use at MMU from a usability / functionality perspective – it was described as ‘clunky’
- students have reported usage problems with the VLE
- students report their main support mechanism for the VLE is their friends
- Both staff and students felt the VLE was easy or fairly easy to use.

4.4 SUMMARY

This chapter has detailed the results of both the research interest cycle and the problem solving interest cycle. Both cycles’ results were presented following the steps of the framework as it was operationalised within each cycle.

The step-by-step processes used in both the Research Interest cycle and Problem Solving Interest cycle will now be analysed, reflected upon and discussed in detail in the next chapter.

Chapter 5: ANALYSIS AND DISCUSSION

5.1 CHAPTER SUMMARY

This chapter analyses and reflects upon the results found in the previous chapter. The analysis and discussion contained herein is threefold; the Research Interest cycle; the Problem Solving Interest cycle; and the research project as a whole.

The Research Interest cycle analyses the research process adopted for this research project by looking at the steps taken from inception to completion. The first over-arching research question, and sub-questions, posed in the literature review are revisited in light of the findings of the empirical research. The viability of adopting SSM as a framework for evaluation is assessed along with whether the Measures of Performance put forward by Checkland (2000) need to be contextualised to Information Systems used in Higher Education in the UK.

The Problem Solving Interest cycle looks at the practical aspects of this research project, or 'Action', in the collection of empirical data. This aspect of the project concentrated on carrying out the evaluations of the MLE at MMU and follows a step by step process. These steps are analysed in the context of having completed the project and lessons learnt are considered. The second research question is addressed in this section as a full discussion of the stakeholder analysis is included.

Finally, a holistic view of the research project is considered. This pays particular attention to methodological issues in adopting dual cycle Action Research along with the involvement of stakeholders in this process. Further issues with methods are also considered.

It is the Research Interest cycle that will be dealt with first.

5.2 Research Interest Cycle Analysis

The Research Interest Cycle deals specifically with the first research question that this dissertation, and the research as a whole, is aiming to address. The research question will be discussed in detail along with a reflection on the dual cycle Action Research methodology adopted for this project. These will be dealt with later in this section but first is a consideration of the first research sub-question.

5.2.1 Research Question 1a

As a reminder, the research question is:

> Research Question 1a — Can SSM provide a suitable framework for evaluating an MLE?

This is the principal research question as it judges the suitability of SSM as an evaluation framework. The completion of the Problem Solving Interest cycle has provided rich insights on the use of SSM in this context.

SSM was chosen as a methodology to guide the process of evaluating MLEs in UK HEIs as it promised the ability to:

- capture the locally situated version of an MLE
- cope with the complexity of a system that has an unspecified number of variables
- identify and encompass stakeholders' needs to strengthen results utilisation
- and gather data on patterns and varied underlying processes to understand why certain phenomena have been observed.

In looking at these criteria, as an evaluation tool, SSM fulfilled its requirements. Rich picture techniques allowed key local aspects of the MLE to be captured with ease and are flexible enough to deal with the demands and variance of any system. Stakeholders were represented within the evaluation framework and their needs accounted for accordingly. As the

framework was not prescriptive about the methods used to evaluate the MLE a pragmatic approach to the evaluation could be taken.

The value in using SSM was the guidance it gave to thinking and learning about the problem situation i.e. how MMU should evaluate its MLE. SSM was not used in a prescriptive sense as a sequential process but elements of the SSM methodology were adopted and used. This is more akin to the Mode 2 form of enquiry in SSM where the process is one of interaction with the problem situation as opposed to external intervention as found in Mode 1 (Checkland & Scholes, 1999:281). It is an appropriate use of SSM as Mode 2 is often found where the 'problem solver' is internal to the organisation and is learning about the problem situation in order to make improvements to it.

The aspects of the methodology found to be most useful were: the rich picture, in depicting the problem situation; and taking the world views of the different stakeholder groups in order to create a composite map showing overall stakeholder requirements. Constructing theoretical evaluation models from the perspective of the project and the stakeholders' requirements has allowed evaluation criteria to be conceptualised and categorised. It has also driven the Evaluation Plan by providing the basis upon which the evaluations take place. The results of the Evaluation Plan for each iteration have been produced and reflected on and changes made to the process as the research project progressed. The Evaluation Plan that was operationalised was also accepted by the MLE project management and Directorate and was summarised for the University's Board of Governors, ensuring the approach had buy-in from the highest possible level.

Upon completion of each iteration, at step 6 of the Research Interest cycle, a meta-evaluation took place to assess whether: SSM provided an evaluation framework to fulfil the knowledge requirements of the stakeholders and the MLE Project Board (efficacy); the evaluation was carried out in the most efficient way, bearing in mind alternative approaches (efficiency); the evaluation results were used by MMU to further develop the MLE and the theoretical knowledge generated furthers the research in this research area (effectiveness). Each of these issues will now be addressed.

It is clear from all the findings presented in Chapters 3 and 4 that SSM did provide an evaluation framework which fulfilled the knowledge requirements of the stakeholders and the MLE Project Board. Through the stakeholder analysis, a detailed view of stakeholder requirements was produced. This allowed the MLE to be viewed from various stakeholder worldviews and these thoughts were brought together to find the points at which they coalesced. This process is wholly consistent with using SSM as a methodology where the views of stakeholders play an important role. Using SSM has put the stakeholders at the centre of the research project and it is their views that have formed the Evaluation Plan. As a result of the evaluations, the Project Board were better able to make decisions about the future of the MLE at MMU, and indeed altered scope accordingly.

It was considered that the evaluations for each iteration were carried out in the most effective way bearing in mind alternative evaluation approaches and resource availability. The methods employed were considered at the end of each iteration and changed where appropriate. For example, at the end of the first iteration it was decided to adopt focus groups as a means of gathering stakeholder criteria, as opposed to individual interviews that proved too time consuming. The reflection of methods followed a pragmatic approach that allowed those methods deemed appropriate to be utilised. This took account of the criteria that would be measured and the alternative methods that could be employed versus pressures on resources, principally time.

The evaluation results were used by MMU to further understand and develop the MLE with the results of the evaluations being fed back to the appropriate bodies within the institution. The evaluations highlighted the issues surrounding the system. The Project Team recognised that whilst the idea of using a VLE amongst the staff and students was widely accepted as a positive move, the VLE in use was found to have multiple issues. These were around its functionality, usability and performance. Following a review in 2009, the decision was taken not to renew the licence on the existing VLE, which was due to expire in August 2011, and explore future possibilities. As

will be discussed in section 5.4.3, the results and analysis of the evaluation process, particularly that of the Random Forest Analysis, helped support the decision making process for the future MLE at MMU. This counterbalanced research that had been taking place about the future role of VLEs in institutions, and encouraged caution. As a result, contrary to some commentators in the field (Wassall, 2005; Weller, 2007a, 2007b; Wheeler, 2009), a VLE was chosen as a core component of the MLE for MMU in the future.

It is therefore my thesis that the SSM approach as operationalised and developed within this study provides a viable framework for evaluating large-scale information systems, such as MLEs, in UK HEIs.

In operationalizing SSM as a framework for evaluation, the Rose & Haynes (1999) model was used. In reflecting upon the use of this framework and its appropriateness to the evaluation task, a two-part process will be followed. Firstly the framework used within the Research Interest cycle will be reflected upon before reflecting on the use of this framework for the Problem Solving Interest cycle. Whilst the Problem Solving Interest cycle framework is operationalised in steps 4 and 5 of the Research Interest cycle, reflection of this on a step by step basis will not take place until after the reflection of the Research Interest cycle has been completed to avoid any confusion between cycles.

5.2.1.1 Reflection on the Research Interest Cycle

A framework was used to inform the Research Interest aspect of the study. As a reminder to the reader, this framework is shown in Figure 5-1.

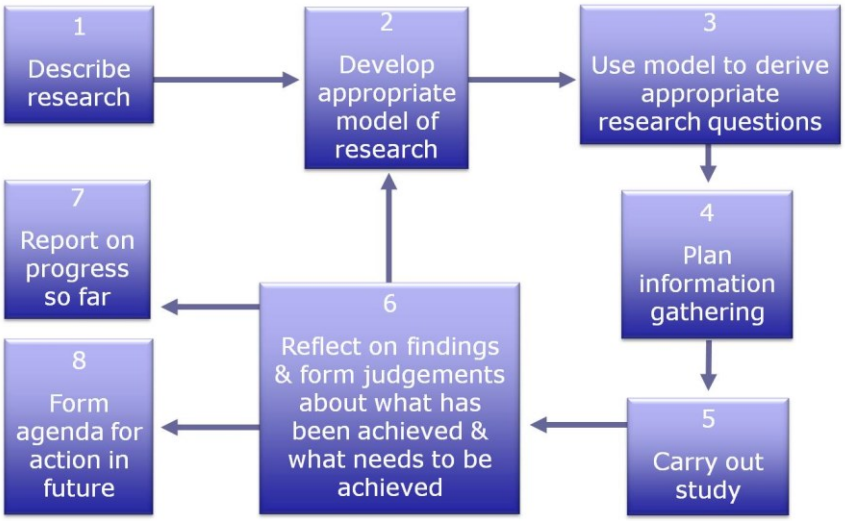


Figure 5-1: Framework for Research Interest (adapted form Rose & Haynes, 1999)

The model as a whole allowed for the research process of this project to be tracked through. It gave an understanding to the researcher of the point the research had reached and gave tools, such as the rich picture, to conceptualise the research problem and the process by which this problem would be operationalised. Each step in the process was unique and added value to the process. Each step is now considered.

Step 1 – Describe Research

The rich picture (Checkland & Scholes, 2003) generated for this step, as found in Figure 4-2, allowed for the research problem to be conceptualised and expressed. This did not change throughout the research process and proved useful, not only to the researcher to understand the problem but also the supervisory team. Step 1 provided an opportunity to understand and conceptualise the research problem undertaken in this study and as such was the facilitator in getting the research started.

Step 2 - Develop Appropriate Model of Research

Step 2 focused attention on the literature review and, from this literature review and subsequent illumination of gaps in the literature, a root definition of the research was developed as shown in Figure 4-2. This root definition set the scope of this research project and provided a mechanism to be explicit about the research problem.

Step 3 - Use Model to Derive Appropriate Research Questions

This part of the process drove the research questions on which this research project is based. This is an important step in any research process but the explicit nature of the framework formalised this step and helped put into place the solid foundations on which this research is built.

Step 4 – Plan Information Gathering & Step 5 – Carry Out Study

At this point in the study, the research became a practical process. The Problem Solving Interest cycle was the focus of attention. The results of steps 4 and 5 provide the empirical research on which this project is built and so the steps in themselves are an extremely important part of this, or any other, research project.

The practical aspect of this research, the Problem Solving Interest cycle, also followed a step by step process. By its nature it was very similar to that of the Research Interest but had a focus on the evaluation of the MLE as opposed to the research project.

As was discussed in the methodology chapter, the framework for carrying out the evaluations was adjusted to take account of the stakeholder involvement. The updated framework can be seen in Figure 5-2.

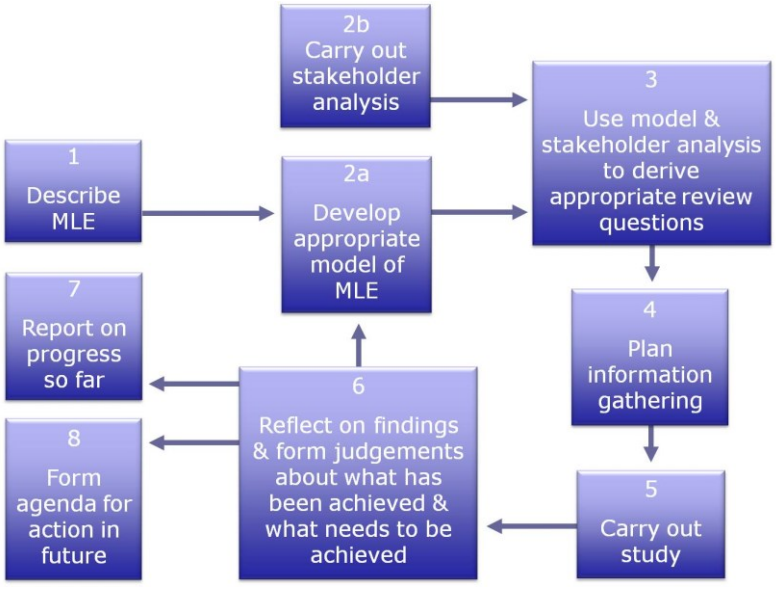


Figure 5-2: Revised Model to Evaluate MLE (adapted from Rose & Haynes, 1999)

The model was revised by the addition of step 2b, thereby including a stakeholder analysis of their evaluation criteria requirements into the evaluation process. Stakeholders were key to this research project whereby the 'weltanschauung' (Rose & Haynes, 1999), or world view, of the different stakeholders was taken account of in the evaluation process by driving the evaluation criteria upon which the evaluations were based. To avoid confusion between the two cycles, a further analysis of the steps taken in this approach is found on completion of the Research Interest cycle later in this section.

Step 6 – Reflect on Findings and Form Judgments About What has Been Achieved and What Needs to be Achieved

The reflection that takes place at this step was an important part of the research process as it is this that ensures the process of action is reflected upon and lessons learnt made explicit.

Step 7 – Report on Progress So Far and Step 8 – Form Agenda for Action in Future

As the final report, in this case this thesis, is the result of these two steps, so the steps are an important aspect of ending one iteration before embarking on the next. Step 7 could equally end with other types of reports on progress, such as a journal article or paper for a conference. Plans for further research in this thesis, at step 8, are found in the final chapter and form the action agenda for the future.

Summary

This step-by-step process very much follows that of a standard research project and so maps perfectly to the requirements. Whilst Checkland & Scholes (1999:281) do not advocate the use of an externalised step-by-step process for operationalising SSM, in this instance, it was extremely useful to do so. The framework that was followed in both the Research Interest cycle and the Problem Solving Interest cycle, allowed for the complex nature of this multi-faceted research project to be kept 'on track' over an extended period

of time. With attention being paid to both the 'action' and 'research' parts of the project, it assisted the researcher in the execution of the role of evaluator and researcher over the three year fieldwork period and beyond. It also helped the researcher, at every point in the process, to conceptualise the point the research had reached. This is important, especially for a longitudinal research project such as this, with the inherent complexity longitudinal research brings (Ruspini, 2002). The longitudinal nature of the project coupled with Action Research and the 'going native' issues that can arise from this mean that having clarity regarding progress and position of the research is helpful in the extreme. The next section will reflect on the step by step process of the Problem Solving Interest cycle.

5.2.1.2 Reflection of Problem Solving Interest Cycle

In this section the step by step process that has been used for the evaluations are reflected upon. Each step is dealt with separately.

To serve as a reminder to the reader, the model that was used in the evaluation process can be found in Figure 5-3.

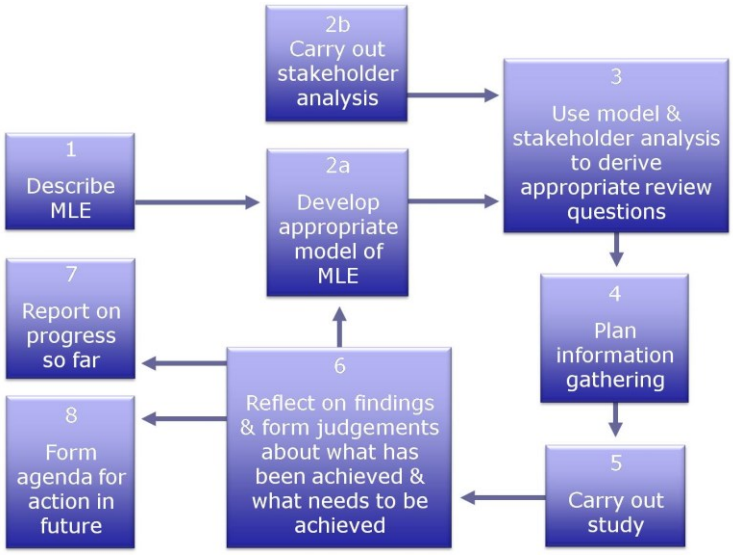


Figure 5-3: Model for Evaluating the MLE

Step 1 - Describe MLE

This step is useful as it allows the problem to be considered. At the start of the evaluation cycle in the first iteration a rich picture was produced. This showed the problem pictorially. For this research project the practical problem remained the same throughout as the timescale involved did not take the project past the first phase. This may not always be the case and so new versions of a rich picture would need to be produced. This step therefore would allow the evaluator an opportunity at the start of each round of evaluations to re-assess the problem and ensure a complete understanding of the issues surrounding the evaluations.

Without this step the evaluator would not have as deep an understanding of the system under study. Therefore depth, breadth and context of the system to be evaluated would be missing. Thus this step is required.

Step 2a – Develop Appropriate Model of MLE

The development of the root definition of the MLE project found in Figure 4-6 took place outside the evaluation process, as it was a part of the MLE development. The evaluations did however impact upon this model and influenced its development at the end of each iteration. In the first iteration it was used in conjunction with the Stakeholder Expectation Model to inform step 3. In and of itself this model is useful as it states clearly what the MLE is. This step is similar to step 1 but allows for greater clarity with a precise definition of the system under study and it explicitly sets the context by which the evaluations are going to be taking place.

Step 2b – Carry Out Stakeholder Analysis

For this practical aspect of the evaluation process, this step was one of the most important. It gave the stakeholders to the MLE a voice in the evaluation process and as the purpose of the research project was to take a stakeholder approach, it was this step in the process that allowed this to happen. The resultant Stakeholder Expectation Model found in Figure 4-10 is a useful artefact. A more detailed discussion of this model can be found in 5.4.2.1.

Step 3 – Use Model and Stakeholder Analysis to Derive Appropriate Review Questions

In the first iteration the MLE root definition, from step 2a, and the Stakeholder Expectation Model, from step 2b, were brought together to form the Evaluation Plan. This suited the purposes of this first evaluation as it was designed to follow a 'light touch' approach and so every criteria raised by stakeholders, and those that were not but were part of the model, were evaluated. As will be discussed later in this chapter, this proved to be very time consuming and as such the process for criteria selection was adjusted upon reflection of iteration 1.

The second iteration started with a change to the MLE model. The evaluation criteria from the stakeholder evaluation were again brought together with the MLE project model. Due to the changed project model, all criteria from the stakeholder analysis could be successfully mapped to the MLE project requirements. Conversely, only one project requirement was not met by the stakeholder analysis, namely defining appropriate indicators of project success and risk exposure. Due to resource constraints, however, the evaluation metrics eventually decided upon only took account of those criteria where the majority of stakeholders had agreed. This meant that a number of aspects were not evaluated both from the stakeholder analysis and the MLE project model requirements.

A similar situation was found in the third iteration whereby in bringing together the stakeholder analysis criteria and the project model, project requirements were not taken account of in the mapping exercise. Again, however, resource constraints resulted in a reduced set of criteria forming the evaluation process.

It could be suggested at this stage that if there are constraints on the resources available within the HE setting and hence a reduction in the number of evaluation criteria taken to the next stage, then the mapping exercise may not be required. This would be due to the stakeholder analysis

driving the final criteria used in the evaluation process. However, this may not always be the case and therefore this step should not be discounted.

The second part of this step, derive appropriate review questions, was followed and this is a vital part of the evaluation process. This clearly lays out which criteria will be evaluated. For this project the decisions were made about where a cut-off point would lie but this would not always be the case if a greater number of people were involved in practical aspects of carrying out the evaluations.

Step 4 – Plan Information Gathering

This is a fundamental step in the evaluation process. Creating a plan allowed all the criteria to be laid out. In the first iteration, a whole host of sources were used and the plan was a useful artefact to see this clearly. For the second and third iterations, alternative sources were not available but the plan still allowed the criteria to be seen clearly and allowed the Project Team to see what evaluation metrics were going to be used for the evaluation in a given iteration.

An important aspect of the approach taken in this research was the use of data that already existed. It is recognised within the institution that students in particular have a tendency to be over-surveyed and so survey fatigue could be experienced (Porter et al., 2004). By taking the approach of using existing studies it not only reduces the burden on students to taking part in research activity but it also reduces the requirement on the part of the evaluation team to collect data to meet the needs of the evaluation metrics derived in step 3 of this process.

A full analysis of the Evaluation Plan developed for this research can be found in 5.4.2.2.

Step 5 – Carry Out Study

This is another critical step as it is the point at which the evaluations take place. The main purposes of the steps preceding this point are to ensure that

this step happens. The evaluations carried out are done so at this point and so make this step crucial to the framework.

Step 6 – Reflect on Findings and Form Judgements About What has Been Achieved and What Needs to be Achieved

This step is vital in this longitudinal, evaluation process. It provides an opportunity to reflect on the decisions that were made at the start of the individual iterations and the methods employed in order to ensure that they were suitable for the role they played. In this way, the lessons learnt from one iteration can be carried forward to the next.

Step 7 – Report on Progress So Far

Reporting on progress to the project manager and the Project Board was vital. It allowed for the results to be taken account of in the decision making process surrounding the MLE and its future. As such, the evaluation results counselled caution in the decision about the future of a VLE at MMU. As has already been pointed out, this challenged the current thinking in the VLE community with UK HEIs.

Step 8 – Form Agenda for Action in Future

Step 6 directly informed this step whereby reflections on the findings and what had been achieved formed the agenda for the next iteration of the evaluation process. It explicitly allows for the agenda for the next iteration to be formulated for clarity.

Summary

Each step of this process contributes to the evaluation process although some steps may be of marginally greater importance in ensuring that evaluations achieve their goal. Understanding the system to be evaluated (step 1), gathering information to inform the decision of what metrics to base the evaluation on (steps 2 and 3), carrying out those evaluations (steps 4 and 5) and reporting and reflecting on the results (steps 6, 7 and 8) form the evaluation process. Each step allows for the smooth transition to the next

and means that the evaluator understands the point in the process that they are at. The backbone of the process is undoubtedly to understand the metrics on which the evaluations would be based along with the carrying out and analysis of results. Therefore, these are viewed with marginally greater importance.

This section has reflected upon the two frameworks used to inform the processes for both the 'research' and 'action' parts of this research project. Both frameworks were considered to be vital in a project such as this. Each step of both frameworks plays a part in ensuring the successful completion of the evaluation process. The next section will reflect on the use of the dual cycle which was followed throughout.

5.2.2 Action Research in Action

As discussed in the methodology chapter, this research followed a dual cycle action research approach (McKay & Marshall, 2001). As has already been discussed, the approach separates out the 'action', or the practical problematic situation, from the 'research', or generating of knowledge, and enables the researcher to focus individual attention on each of the separate cycles.

In the first instance, this was a very useful tool. As the researcher was new to conducting this type of research, the concept of the dual cycle allowed for a greater understanding and conceptualisation of the research being undertaken. The research project was complex and any assistance, especially in the early days, was of great benefit. By separating out the two pillars on which the methodology was built, namely action and research, clarity dawned and the distinct aspects of each part of the research project could be seen. This resulted in the dual cycle being reflected in all aspects of this research project from the frameworks adopted for the Research Interest and Problem Solving Interest cycles, to the layout of this thesis and the way in which this research has been reported.

As the research project was underway, in practice, it was difficult to run the cycles concurrently in the way it was envisaged when the cycles of McKay &

Marshall (2001) were adopted. The very nature of the Action Research project has meant that there were long time periods where the Problem Solving cycle was being 'actioned'. During this time, the Research Interest cycle was laying fairly dormant. In a longitudinal research project such as this, however, this is to be expected. The value of the dual cycle lies in knowing which cycle is currently 'in play' and at what point along that cycle the other is.

5.2.3 Summary

The focus on the Research Interest cycle, which incorporates the Problem Solving Interest cycle, was the operationalisation of the research coupled with answering some of the research questions. Both frameworks proved a useful tool in ensuring this complex research process kept on track. In answering the research questions; SSM was found to be a framework that works within the dual cycle environment that framed this research. At the research level the framework proved useful in keeping the researcher focused on the 'Action' and the 'Research'. When used for evaluating an MLE, the framework needed modifying in order to take account of varying stakeholder involvement. As there was no clear evidence of ethicality, the measures of performance needed to be adjusted within the UK HEI context although removal of this dimension completely from the measures of performance model would, at this stage, be inappropriate. Finally in this section, a review of the dual cycle action research methodology, adopted for this research, was conducted. This was found to be a useful tool in the conceptualisation and understanding of the research process and allowed the researcher to keep a focus on both aspects of the research in action.

Having answered the first part of this research question, it is now possible to assess whether the measures of performance are suitable within the context of this MLE in a UK HEI. The next section will assess this more closely.

5.2.4 Research Question 1b

As a reminder, research question 1b is:

Research Question 1b — Do the Measures of Performance (5Es) encompass all the evaluation criteria, based on stakeholder expectations, for an MLE in UK HEIs? If not, what adjustment to the Measures of Performance would contextualise them to MLEs in UK HEIs?

In order to assess the impact on the measures of performance, the evaluation criteria have been mapped to the measures of performance, as shown in Table 5-1. The evaluation criteria, which the measures of performance are mapped against, encompass all those raised by the stakeholder analysis across all iterations.

	Requisite Knowledge and Under-standing				System					Impact on Students				Impact on Staff					Impact on Business Processes					Project Management				Impact on Univer-sity	
	Support	Training	Sharing Knowledge	Understanding Value Added	Usage	Usability	Performance	Availability	Requirements	Experience	Expectations	Success	Culture	Routines	Perceived Benefits	Workload	Experience	Expectation	Culture	Assessment	Admin	Change Process	Change Management	Programme Management	Progress	Communications	Development	The Future	Learning Facilities Provision	Public Confidence
Efficacy	✓				✓		✓				✓					✓		✓	✓							✓			✓	
Efficiency	✓	✓	✓	✓	✓	✓	✓			✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	
Effectiveness	✓							✓	✓	✓		✓	✓				✓		✓					✓				✓		
Ethicality																														
Elegance						✓																								

Table 5-1: Evaluation Criteria Mapped to Measures of Performance

All of the evaluation criteria across all three iterations have been successfully mapped to one of the measures of performance. This means that the measures of performance are suitable measures on which to judge the performance of the MLE at MMU with no additional measures needed.

From the alternative perspective, however, all but one of the measures of performance have been successfully mapped to the evaluation criteria. There have been no instances of any criteria that would encompass the measure of ethicality discussed by either the stakeholders or the Project Team.

Therefore, four out of the five measures of performance fulfil the requirements of the evaluation process for the MLE at MMU.

However, no instances of ethicality were identified based upon the interpretations by the researcher of what the stakeholders meant. There is a possibility that the researcher mis-interpreted the words that the stakeholders used as, in the elaboration of a point made by the interviewees, ethicality may have emerged. One example of this could be the issue of system availability. Availability has been taken to mean how accessible the system is off-campus. It could however be taken to mean the availability of the system for all students all of the time and not the interpreted version of being able to use it anytime anyplace. Those students from disadvantaged backgrounds may not have the internet available in their home and so would be at a disadvantage to their better off peers. Therefore whilst the system is available to be used by all it is not available to them all of the time. Only by exploring meaning would this distinction be made clear. Further research would be needed in order to clarify the meaning of these issues and further conclusions drawn about the issue of ethicality as a measure of performance. In such a large project, with multiple constraints on time, it was not possible to pursue this aspect of interpretation.

The mappings to the measures of performance are, as can be seen in Table 5-1, distorted around the efficiency dimension. The issues of ‘does it work’ (efficacy) and ‘is it effective’ (effectiveness) are given a fairly equal weighting with elegance having only a single entry.

The efficiency dimension was characterised in the literature as checking whether the transformation is carried out with the minimum resources (Checkland, 1999). Given the pressures on institutions in terms of increased student numbers, and a rise in the staff / student ratio, it is not surprising that examination of the MLE focused on resource gains. As Hughes (2009:15) points out, the collection of tools within an MLE provide a very ‘powerful resource’ of benefit to the institution and it would appear that this message has been received by the stakeholders in terms of their perceptions of an MLE.

The result of these findings is an adjustment to the multi-method model proposed in the literature review for evaluating the MLE. Further research may reveal the importance of the ethicality dimension not only due to the single institution basis of this research but also the long term changes in perceptions experienced by the stakeholders. These changes have already been seen within the changing requirements of the stakeholders over the course of this research project which is discussed in detail later in this chapter. It would therefore be inappropriate at this stage to exclude ethicality completely from the model and so it has been tentatively demoted in importance. The adjusted model is shown in Figure 5-4.

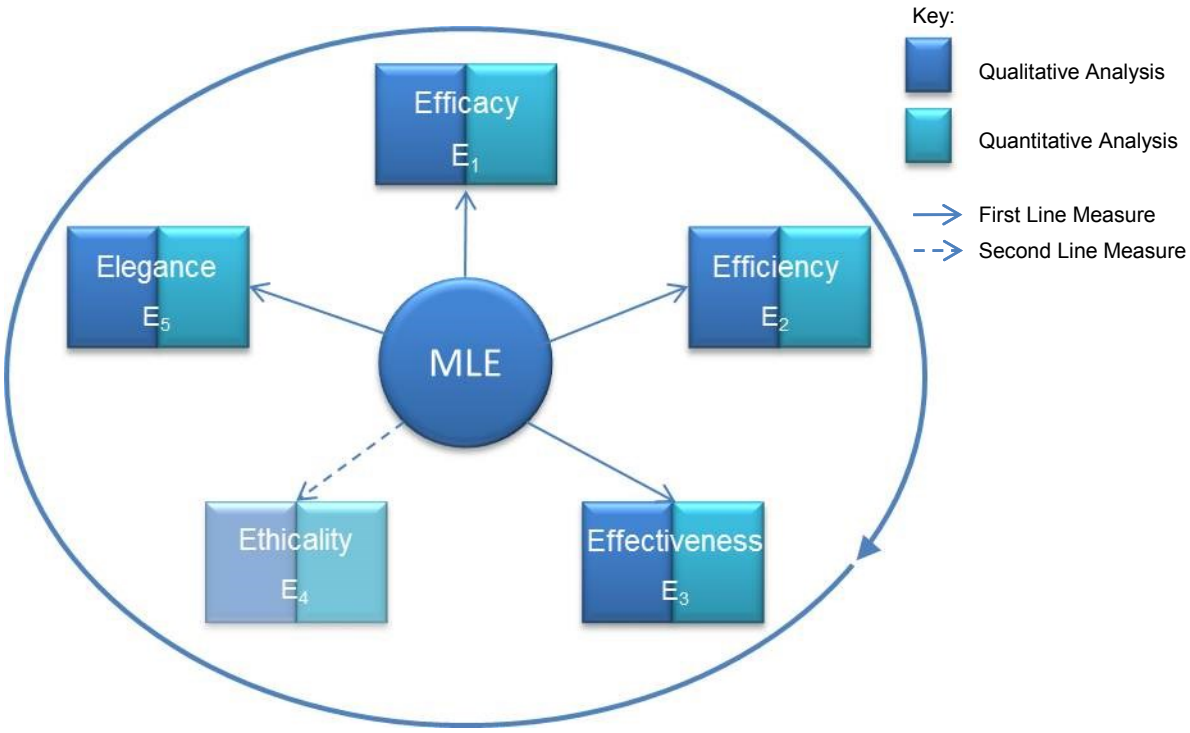


Figure 5-4: Proposed Measures of Performance Contextualised to an MLE

As can be seen in Figure 5-4, ethicality has been relegated within this framework leaving four measures of performance as the first line measures. This research was designed to take a high level view of the stakeholder requirements and so the opportunity to explore the issue of ethicality further was not presented. Further research into this important area will allow for this dimension to be explored in greater depth and to further understand the role this dimension plays within the stakeholder requirements for evaluation.

Having concluded the research element of this project, it is the action element that will be discussed in the next section.

5.3 Problem Solving Interest Cycle Analysis

The Problem Solving Interest cycle gave an opportunity to answer the second research question and to assess the impact of the evaluation process of the MLE at MMU. There are a number of areas where the impact has been most apparent: the stakeholder approach to developing the evaluation criteria; the evaluation process of the MLE at MMU; and the impact the evaluations have had on the MLE project at MMU. Each of these aspects will now be looked at in more detail.

5.3.1 Research Question 2

As a reminder, the research question is:

> Research Question 2 How should stakeholders be identified and what are their evaluation requirements?

In answering this two-part research question, the next section will address the identification of the stakeholders before considering the evaluation requirements the stakeholders may have.

5.3.1.1 Stakeholder Identification

In using the categorisations for stakeholders as suggested by Farbey at al. (1993), it was possible to highlight stakeholder groups within the institution. The desire, from the researcher's perspective, was to gain a holistic view of the MLE and so invite stakeholders to contribute their thoughts to match this desire. It was a straightforward process of mapping existing organisational groupings to those suggested by Farbey at al. (1993) and the framework proved sufficiently flexible to accommodate changes considered appropriate year-on-year. It allowed for stakeholders from many different areas of the institution to be involved in this research project, as shown in Table 5-2, and helped the Project Team to gain a fully rounded perspective on the requirements of the stakeholders.

Stakeholder Grouping (Farbey et al., 1993)	Participants in First Iteration	Participants in Second Iteration	Participants in Third Iteration
Strategic Apex	Deans	Deans	Pro-VC Student Experience Deans
Middle Line	Faculty Registrars	Faculty Registrars Heads of Department	Faculty Registrars Heads of Department
Champions	SLTF	SLTF CELT	SLTF CELT
Support Staff	Faculty Registrars	Faculty Administrators Library Managers	Faculty Administrators Library Managers
Technostructure	Information Systems Managers	ICTS Managers	ICTS Managers
Operating Core	Academic Staff Students	Academic Staff Students	Academic Staff Students

Table 5-2: Stakeholder Participants Across All Iterations

The stakeholder groupings framework was used as a high-level guide and its flexibility allows for an institution to make their participant selections based on their local organisational structure. Some of the high-level categories have a greater degree of flexibility than others. For example, the Technostructure category has a greater clarity of description to the type of stakeholder this group may comprise than does Middle Line and so there is less scope for changes in future iterations. However, the opportunity for local interpretations ensures that a researcher is able to choose those stakeholders judged most appropriate and changes made where necessary. As has been discussed, some changes were made to the stakeholder selections for this research project from one iteration to the next. The framework allowed these changes and so, rather than constraining the stakeholder selection process to be bound by the requirements of the framework, it affords the process the flexibility needed in order to satisfy the variability of UK HEIs.

As a result of the final stakeholder groupings for this research, it is possible to adjust the Farbey et al. (1993) evaluation stakeholder framework to contextualise it to an MLE in a UK HEI.

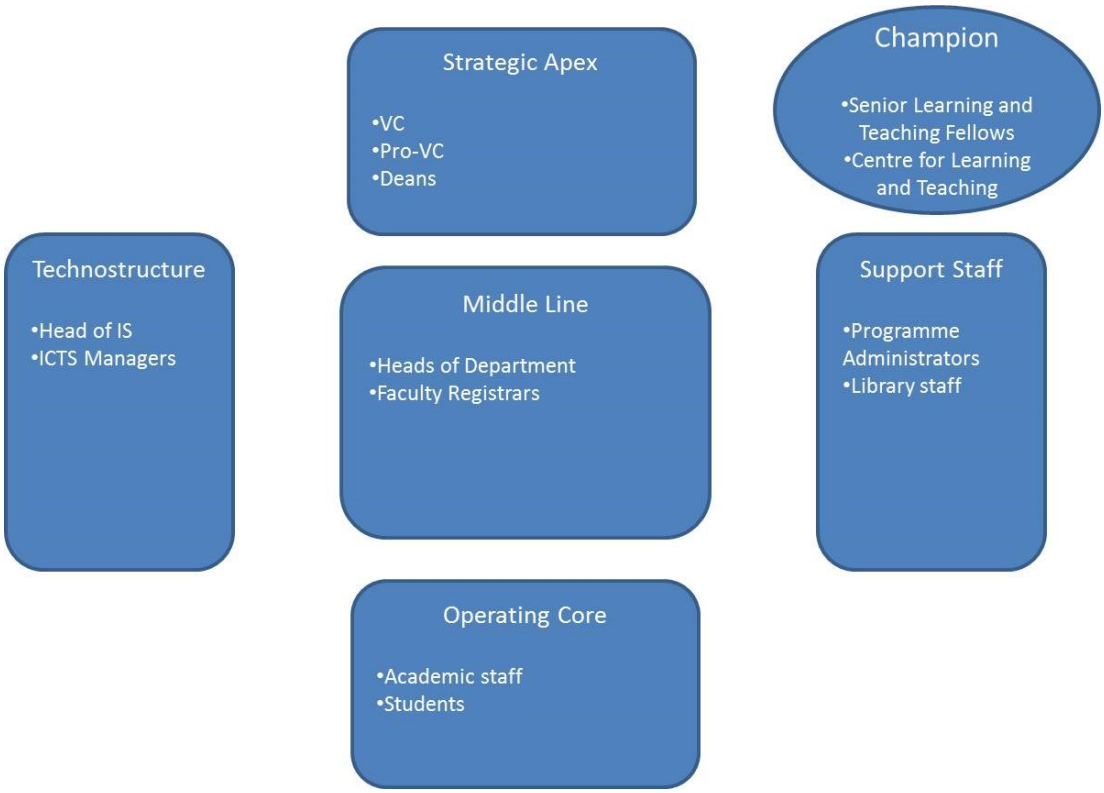


Figure 5-5: Evaluation Stakeholder Map Contextualised to MMU (adjusted from Farbey et al., 1993)

Further research would illuminate whether this contextualisation was consistent with other UK HEI's or whether further adjustment would be necessary.

Following on from the selection of the stakeholders involved in the evaluation process, it is the stakeholder evaluation requirements that will be discussed in the next section.

5.3.1.2 Stakeholder Evaluation Requirements

In answering this aspect of the research question, it is necessary to reflect on the stakeholder analysis that was carried out as the issue of requirements gathering are embedded within this process. There are a couple of aspects to the stakeholders' analysis: the methodological approach; and the criteria selected. These will each be looked at in detail. This section will also reflect upon this stakeholder approach.

5.3.1.2.1 Stakeholder Analysis: Methodological Approach

In this section, a number of issues regarding the methodological approach employed within this research project are reflected upon. This reflection includes:

- the methodology for gathering stakeholder requirements followed throughout this research project and conclusions drawn about its effectiveness
- changes to the methodology and whether these had an impact on the criteria deemed important for evaluation by the stakeholders.

Individual interviews of the selected stakeholders were held in the first iteration but changed for the second and third iterations to group interviews. The time-consuming nature of 1-1 interviews, not only in execution but also in analysis terms, was considered to be unacceptable. The research team consisted solely of the author and so time was a precious commodity. Therefore any efficiency gains would be extremely beneficial to the researcher and hence the project as a whole.

Mind maps, utilised for presenting the evaluation criteria data generated during the interviews, were by individual interviewee and constructed post interview for the first iteration, hence, very time consuming. Using group interviews in the second and third iteration, where the mind maps were constructed during the interview, had a huge impact on the efficiencies of this aspect of the project. More stakeholders were involved in the process with less effort on the part of the researcher, and so the change was regarded as successful.

However, whilst this was a positive outcome to the changed process, it is important to assess whether this had an impact on any other aspect of the research data collected. The methodological approach to gathering stakeholder expectations allowed the issues important to the whole group to emerge. When the data gathering utilised interviews, the data from these interviews was amalgamated to form a group opinion and so every member of the group had an individual voice in the final criteria. When the

stakeholders were gathered into their groups, however, did this remain the case? It would be difficult to know unequivocally whether each member expressed all their thoughts when the groups were together without further research although the facilitator gave the individual group members ample opportunity to express any viewpoints they held. It is important within any group interview to allow each participant to have a voice (Bloor et al., 2001). Exploring this issue was outside the scope of this study and could form the basis for further study. However, this was recognised as a potential problem and so in an attempt to overcome this issue, the constructed mind maps were distributed to the group attendees, post interview. This was for two reasons: to check whether the researcher's interpretation of what was said at the time was correct; and to give each stakeholder the opportunity to express any further ideas they may have. This second point allowed for ideas to come to light that the individual stakeholders either did not feel comfortable expressing at the time or that occurred to them post the focus group.

A majority of the stakeholder groups consisted of colleagues from across the university. It is assumed that 'better data' is obtained when participants are 'strangers' (Stewart & Shamdansani, 1990; Smith, 1972 cited in Morgan, 1993; Morgan & Krueger, 1993) although the influence of 'acquaintanceship' is only thought to be modest at best (Stewart & Shamdansani, 1990). This would be near impossible to achieve within the confines of a single institution. Some of the stakeholder groups, such as the Champions, were too discrete to allow for a 'strangers' approach to be adopted, although it was achievable with the Operating Core with groups of students.

The response to the validation exercise was interesting. When the mind map only contained their individual views, the response rate was greater than when the mind map was an amalgamation of the whole group's ideas. This is illustrated with the Champions stakeholder group. In the first iteration, 8 out of the 10 Champions interviewed validated their mind maps. In the second and third iteration, this dropped to 3 out of 12 and 0 out of 9 respectively. At each of the second and third iterations, the Champions were interviewed as a group. The reason for this changed behaviour could be due to the mind maps

being constructed ‘on the fly’ during the focus group and projected onto a large screen for all to see. This could mean that any misunderstandings in interpretation would have been corrected at the time of construction and so negate the need for post-interview change. It could equally mean that, as this group is made up of academics from across the institution who meet regularly, no individual views were held back due to their familiarity and comfort with the other members of the group. Many had also been involved from the first iteration and so when they knew a group interview was imminent they may have formed a judgement in advance of the meeting the issues they thought were relevant and so had no post-meeting ideas. However, it is recognised that it could also be due to a lower feeling of ownership when the mind map is a group map as task ownership occurs when an individual takes a personal interest in and responsibility for a task (Au et al., 2009) and whilst the attendees may have been interested in the evaluation of the MLE, they may not have taken a personal responsibility for the outcome of developing the criteria. There could also be less enthusiasm for the process due to the iterations being a repeat of the previous years’ and, in many cases, the same people being involved. Only further research would clarify the cause for this behaviour.

One issue that did arise, once group interviews had been adopted as the method for gathering data, was the problem of getting some stakeholder groups together as a group. Most of the stakeholder groups were able to be gathered together for the group interviews without too many issues arising. The senior managers within the organisation however were less amenable to meeting in ad hoc groups due to time pressures and securing a slot on the agenda at meetings was, at times, difficult. Wide-ranging changes were in the process of being introduced across the university, which appeared to have an impact on securing group meetings with these people. It was felt that a pragmatic approach was required on the part of the researcher and so the group approach was abandoned and, where possible, individual interviews were held. This did affect the numbers of people involved at this level as: the time pressures for the researcher meant insufficient time to interview all possible stakeholders; and the numbers of stakeholders occupying those

positions were fewer than some of the other stakeholder groups, so the contingency options were lower. The reduction in the stakeholder numbers in Middle Line group in the third iteration was also due to a cancelled meeting with Faculty Registrars with no options to re-arrange due to the timescales. The actual numbers involved at each stage of the research are shown in Table 5-3.

Stakeholder Grouping (Farbey et al., 1993)	Number in First Iteration	Number in Second Iteration	Number in Third Iteration
Strategic Apex	7	1	2
Middle Line	6 (inc Support Staff)	7	3
Champions	10	12	9
Support Staff	0 (inc in Middle Line)	15	8
Technostructure	5	20	16
Operating Core	10	22	24
Total	**38**	**77**	**62**

Table 5-3: Total Numbers of Stakeholders Involved by Iteration

The lower numbers of stakeholders involved within the Strategic Apex and Middle Line stakeholder groups reflect the access issues as already discussed. These issues may have affected the contribution these groups make to the final criteria outcomes of what criteria are deemed important to the groups. This possible issue will now be considered.

The average percentage contribution, as found in Figure 5-6, shows the average stakeholder contribution to the final criteria listings by iteration fell over the course of the research. It also shows the average number of stakeholders involved across the stakeholder groups.

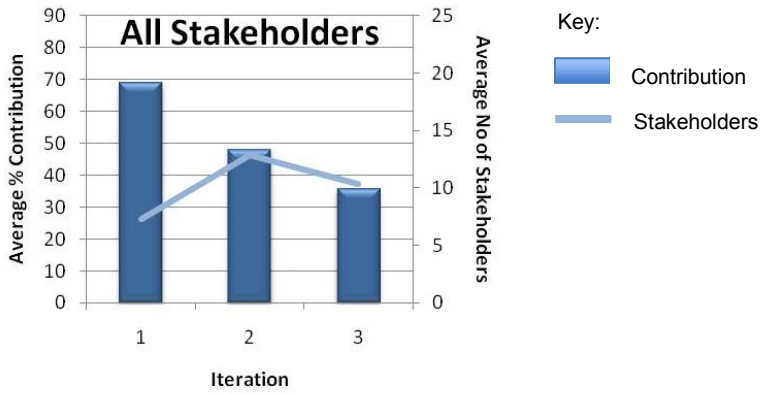


Figure 5-6: Average Contribution for All Stakeholder Groups by Iteration

This followed the general pattern for each stakeholder group with only a couple of exceptions. Figure 5-7, Figure 5-8, Figure 5-9, Figure 5-10, Figure 5-11 & Figure 5-12 show the percentage contributions and numbers of stakeholders involved by iteration for the different groups of stakeholders. To aid interpretation and to ensure that visual representations are comparable, each chart has been produced using the same scales on the primary and secondary vertical axes.

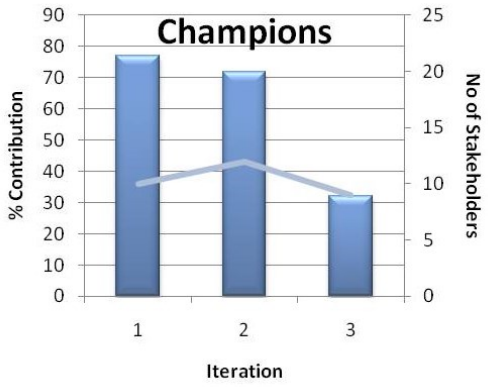


Figure 5-7: Analysis by Champion Group

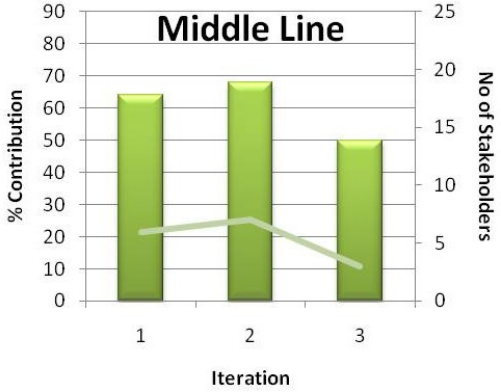
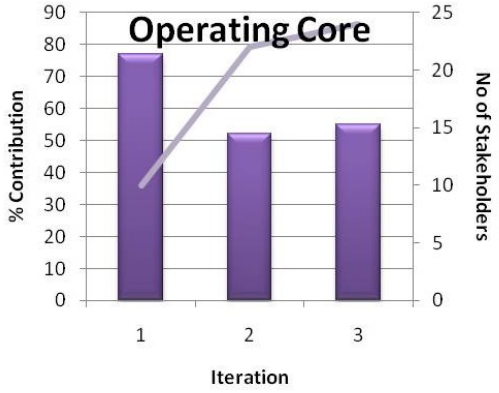


Figure 5-8: Analysis by Middle Line Group



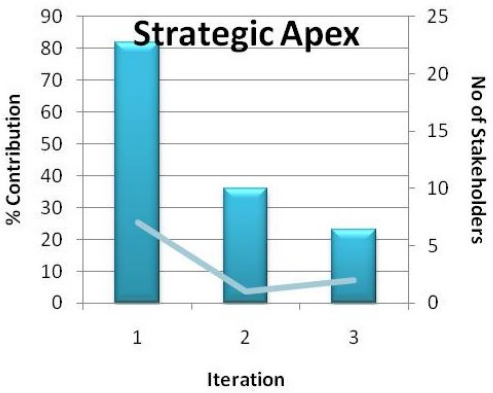


Figure 5-9: Analysis by Operating Core Group

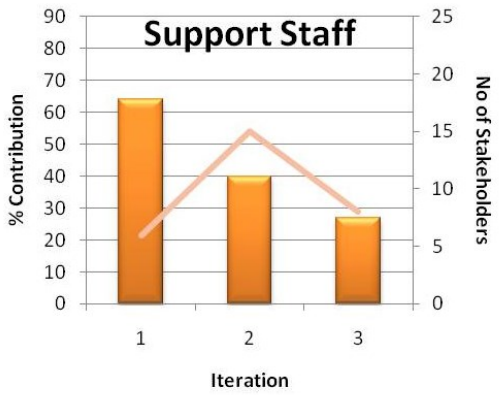


Figure 5-10: Analysis by Strategic Apex Group

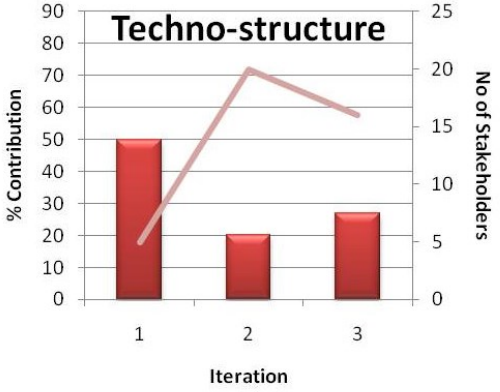


Figure 5-11: Analysis by Support Staff Group

Figure 5-12: Analysis by Technostructure Group

On the face of it, it appears that the lower numbers of stakeholders involved in the Strategic Apex group has had an impact on the criteria that this group have suggested. When a full complement of Deans were interviewed they contributed to over 80% of the final criteria listings whereas when a smaller number were involved the percentages dropped to 36% in year two when only one was involved and to 23% when there were two. This however is contradicted by the findings from the other groups and so could be due to their criteria coalescing around the institutional priorities. The single biggest drop was seen in the Champions group from the second to the third iteration from 72% to 32% respectively. This happened even though the stakeholder numbers held fairly steady in this group: 10, 12 & 9 across the three iterations. It has already been pointed out that this group were fairly consistently constituted across the three iterations and so maybe had considered the issues they thought of as the most important prior to the meeting and so reduced the broadness of suggestions. Middle Line was also a group where the numbers in the final iteration were low. Whilst their contribution in the final iteration was lower than in previous iterations, they still contributed to 50% of the final criteria lists, which was higher than all but one of the other stakeholder groups. The trend in the final iteration was for stakeholders to have a lower range of criteria with the average being 36% so at 50% the Middle Line was well above average. Looking at the Technostructure group, their numbers fell in the final iteration but their contribution to the final criteria list rose. In undertaking a correlation analysis on this data, no statistical significance was found to exist between the

percentage contribution and the number of stakeholders who had contributed.

These examples show that there is no evidence to support a possible issue that the fewer stakeholders involved in the gathering of evaluation criteria, the less contribution to the evaluation criteria that stakeholder group makes. It would be difficult to surmise whether the final criteria outcomes are indeed representative of the whole stakeholder group. However, the findings from the evaluation work have been scrutinised and accepted annually through university committees, such as Academic Development Committee, which are consciously constituted to provide a broad representation from across the institution. Further research would need to be carried out to find the optimum levels of stakeholders that would be needed to truly represent the needs of that stakeholder group.

5.3.1.3 Stakeholder Analysis: Criteria Selection

The criteria thought to be important by the stakeholders for evaluation year-on-year changed, although a core set of criteria remained consistent through all iterations. The criteria that emerged from the interviews / focus groups encompassed a wide range of topics. In the first iteration there was a greater shared vision of criteria across the stakeholder groups than was found in later iterations. Each of the high level categories in the first iteration was considered important by every stakeholder group which was not found in either of the following iterations.

	CH	ML	OC	SA	SS	TS	CH	ML	OC	SA	SS	TS	CH	ML	OC	SA	SS	TS
	Iteration 1						Iteration 2						Iteration 3					
Impact on Students	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	x	x	✓	✓	✓	x	✓
Impact on Staff	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	✓	x	✓	x	✓	✓	x	x
System	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Know How	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	✓	✓
Impact on Business Processes	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	✓	x	✓	✓	x	✓	✓	✓
Project Management	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	x	x	✓	x	x	x	x	x
Impact on University	Not raised in this iteration						x	✓	x	✓	x	x	Not raised in this iteration					
Total	6	6	6	6	6	6	6	7	6	4	4	2	5	4	4	4	3	4

Key: CH=Champions; ML=Middle Line; OC= Operating Core; SA= Strategic Apex; SS= Support Staff; TS=Technostructure

Table 5-4: Stakeholder Views by Category Across All Iterations

Table 5-4 shows the stakeholder views by category across all three iterations. In iteration 1, a very broad coverage of topics was observed and could have been due to a number of reasons.

Firstly, the lack of knowledge about what an MLE is and what an MLE can do for the institution and user, may have led stakeholders to this wider range of views. This could be related to having a 'window of opportunity' in the first year or so after the introduction of a system such as this and, whilst it is new and before a 'crust of familiarity' forms, people are 'ripe with questions and insights' before the system becomes embedded into the day-to-day environment (Zuboff, 1988:13).

It could have also been symptomatic of holding individual interviews where each individual was asked to consider criteria from their own perspective. Holding group interviews in later iterations might have stymied creativity of individuals in considering the issues deemed important by them. It is apparent that there is less shared vision between the groups as the iterations progress but it would be difficult to pinpoint this to the change from individual to group interviews. A possible observation could be that the views of the individuals that make up the groups were maturing as their knowledge and experience of the system grew over the three iterations of this research project.

A further reason could be the issue of groupthink (Esser, 1998) which may have restricted the overall criteria from the focus groups. This however is not thought to be an issue. Primarily, the focus groups were looking for the generation of all ideas from evaluation and did not require the stakeholders to agree a group consensus. The group was not asked to consider what the most important issues were and so there was no conflict experienced within the groups themselves.

In order to fully understand this issue, further research would be needed. One suggestion would be to use a nominal group process (Stewart & Shamdasani, 1990; van de Ven & Delbecq, 1971) for the focus groups whereby each individual works silently and writes down their thoughts and ideas. These are subsequently shared with the group and are used to form ideas representative of the whole group (Stewart & Shamdasani, 1990). These are then ranked in order of importance based on a vote by the whole group (Stewart & Shamdasani, 1990). This would provide two benefits over the original method used. Firstly, it would mean that each individual's views were taken into account thereby negating possible group effects. Secondly, the group's priorities in terms of evaluation criteria would emerge instead of treating each criterion with equal weighting.

Moving on to the criteria that made up each category, a large number of criteria remained constant across the three iterations. Table 5-5 shows the criteria within each category that were considered important across all iterations.

Category	Criteria	Iterations Iteration 1	Iteration 2	Iteration 3
Impact on Students	Experience	✓	✓	✓
	Expectations	✓	✓	✓
	Culture	✓	✓	✓
	Success	✓	✓	✓
Impact on Staff	Perceived benefits	✓		
	Culture	✓	✓	✓
	Routines	✓	✓	
	Experience		✓	
	Expectations		✓	
	Workload	✓	✓	✓
Know How	Support	✓	✓	✓
	Training	✓	✓	✓
	Sharing knowledge	✓	✓	✓
	Understanding value added	✓	✓	✓
System	Performance	✓	✓	✓
	Usage	✓	✓	✓
	Usability	✓	✓	✓
	Availability	✓	✓	✓
	Requirements			✓
Project Management	Progress	✓		
	Communication	✓	✓	
	Development		✓	
	Future			✓
Impact on Business Processes	Programme management	✓	✓	✓
	Assessment	✓		✓
	Admin	✓	✓	
	Change		✓	✓
Impact on University	Learning facilities provision		✓	
	Public confidence		✓	

Table 5-5: All Criteria Deemed Important Across All Iterations

Out of the 21 criteria thought important in iteration 1, 18 were carried forward to iteration 2 and 15 of these remained important across the three iterations. Whilst these core criteria remain constant across all the stakeholder groups, they may have been important to different groups year-on-year. This issue will be considered later in this section. Table 5-6 shows the core evaluation criteria important across all three iterations.

Category	Criteria	Iterations		
		Iteration 1	Iteration 2	Iteration 3
Impact on Students	Experience	✓	✓	✓
	Expectations	✓	✓	✓
	Culture	✓	✓	✓
	Success	✓	✓	✓
Impact on Staff	Culture	✓	✓	✓
	Workload	✓	✓	✓
Know How	Support	✓	✓	✓
	Training	✓	✓	✓
	Sharing best practices	✓	✓	✓
	Understanding value added	✓	✓	✓
System	Performance	✓	✓	✓
	Usage	✓	✓	✓
	Usability	✓	✓	✓
	Availability	✓	✓	✓
Impact on Business Processes	Programme management	✓	✓	✓

Table 5-6: Core Evaluation Criteria Deemed Important Across All Iterations

The core evaluation criteria centre around impact on day-to-day interactions by the user with the system not only in terms of what the system would do for them but also on how it impacts on their role within the university. It would appear that agendas within the university also play a role in driving stakeholder views as illustrated by the focus on student success which changed over the course of this research. The focus in the first two iterations was student achievement and progression but became retention and progression in the final iteration. Retention and progression became a university-wide agenda item during 2008 (the start of the third iteration) and remains so to the time of writing.

The criteria that were not consistent year-on-year are shown in Table 5-7. Wider issues around project management, business processes and a number of issues affecting staff did not experience the same shared vision year-on-year.

Category	Criteria	Iterations		
		Iteration 1	Iteration 2	Iteration 3
Impact on Staff	Perceived benefits	✓		
	Routines	✓	✓	
	Experience		✓	✓
	Expectations		✓	✓
System	Requirements			✓
Project Management	Progress	✓		
	Communication	✓	✓	
	Development		✓	
	Future			✓
Impact on Business Processes	Assessment	✓		✓
	Admin	✓	✓	
	Change		✓	✓
Impact on University	Learning facilities provision		✓	
	Public confidence		✓	

Table 5-7: Inconsistent Criteria Across All Iterations

A new category emerged in the second iteration, and disappeared again in the third iteration. The Impact on the University was considered important in the second iteration, albeit to only two stakeholder groups. These groups represented the management within the university; namely Deans and Heads of Departments. At the time of the research for the second iteration, the university was in the process of huge changes. Plans were in place to rationalise the number of sites currently occupied by the university from seven to three and discussions were taking place about the possibility of flexible learning spaces. As this was a major discussion topic within the university then it is no surprise it should emerge from discussions about e-learning and the possibilities it holds.

These examples show the way in which organisational agendas can influence the stakeholder evaluation requirements. They clearly demonstrate the subjectively situated and changing nature of evaluation criteria and how the criteria can be shaped by external factors dictated by others but adopted by members of the institution.

If the evaluations carried out are to be useful to the institution, they need to reflect the changing nature of the Institution and the Information System it is designed to evaluate. The stakeholders, by the third iteration, had started the process of not just wanting to understand how the project and system had

been doing, but had started to consider the future and the requirements of a system that is becoming an embedded institutional service. Having a flexible framework for evaluation where current topics and issues can emerge, as well as the opportunity to look to the future, is vital to an evaluation process that has meaning to the stakeholders.

The stakeholder groups naturally were interested in different criteria for evaluation. Table 5-8 shows the level of interest by stakeholder groups in each criterion across all three iterations. It highlights each criterion that was raised each year and shows which stakeholder groups expressed the criteria as an evaluation requirement.

		Champion			Middle Line			Operating Core			Strategic Apex			Support Staff			Techno-structure		
		Iteration 1	Iteration 2	Iteration 3	Iteration 1	Iteration 2	Iteration 3	Iteration 1	Iteration 2	Iteration 3	Iteration 1	Iteration 2	Iteration 3	Iteration 1	Iteration 2	Iteration 3	Iteration 1	Iteration 2	Iteration 3
Impact on Students	Experience	✓	✓	x	✓	✓	✓	✓	✓	✓	✓	✓	x	✓	x	x	✓	x	x
	Expectations	✓	✓	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	x	✓	x	x
	Culture	✓	x	x	x	x	✓	✓	x	x	x	✓	x	x	x	x	x	x	x
	Success	✓	x	x	x	✓	✓	x	x	✓	✓	x	✓	x	x	x	x	x	✓
Impact on Staff	Perceived benefits	✓			✓			✓			✓			✓			✓		
	Culture	✓	✓	x	✓	✓	x	x	✓	✓	✓	x	✓	✓	✓	x	x	x	x
	Routines	x	✓		✓	✓		✓	x		✓	x		✓	✓		x	x	
	Experience		✓	x		x	x		✓	x		x	x		x	x		x	x
	Expectations		✓	x		x	x		x	x		x	x		x	x		x	x
	Workload	✓	✓	✓	x	x	x	✓	✓	✓	✓	✓	x	x	x	x	x	x	x
Know How	Support	✓	✓	✓	✓	✓	x	✓	x	✓	✓	✓	x	✓	✓	✓	✓	✓	✓
	Training	✓	x	x	✓	✓	✓	✓	✓	✓	✓	x	x	✓	✓	✓	✓	✓	✓
	Sharing knowledge	x	✓	x	x	x	x	✓	✓	✓	✓	x	x	x	x	x	x	x	x
	Understanding value added	✓	✓	x	✓	x	x	✓	x	✓	x	x	x	✓	x	x	✓	x	x
System	Performance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	x	✓	✓	✓	✓	✓	✓
	Usage	✓	✓	x	✓	✓	x	✓	✓	✓	✓	✓	x	✓	✓	✓	x	✓	✓
	Usability	✓	✓	x	✓	✓	✓	✓	✓	✓	✓	✓	x	✓	✓	✓	x	✓	x
	Availability	x	x	x	x	✓	✓	✓	✓	x	✓	✓	x	x	x	x	✓	x	x
	Requirements			✓			✓			x			✓			x			✓
Project Management	Progress	✓			✓			x			✓			✓			✓		
	Communication	x	x		✓	✓		✓	x		✓	x		✓	x		✓	x	
	Development		✓			✓			✓			x			x			x	
	Future			✓			x			x			x			x			x
Impact on Business Processes	Programme management	✓	✓	✓	x	x	✓	✓	x	x	✓	x	x	x	✓	x	✓	x	✓
	Assessment	✓		✓	x		✓	✓		x	✓		x	x		x	x		x
	Admin	✓	✓		✓	✓		x	x		x	x		✓	x		x	x	
	Change process		✓	x		✓	x		✓	x		x	✓		✓	✓		x	x
Impact on University	Learning facilities provision		x			✓			x			✓			x			x	
	Public confidence		x			✓			x			x			x			x	
		Iteration 1	Iteration 2	Iteration 3	Iteration 1	Iteration 2	Iteration 3	Iteration 1	Iteration 2	Iteration 3	Iteration 1	Iteration 2	Iteration 3	Iteration 1	Iteration 2	Iteration 3	Iteration 1	Iteration 2	Iteration 3
		Champion			Middle Line			Operating Core			Strategic Apex			Support Staff			Techno-structure		

Table 5-8: Level of Interest in All Evaluation Criteria by Stakeholder Groups

Some stakeholder groups showed consistency of interest across all iterations in a number of different criteria. The level of consistency for each stakeholder group can be seen in Table 5-9.

		Champion	Middle Line	Operating Core	Strategic Apex	Support Staff	Techno-structure	Total
Impact on Students	Experience	x	✓	✓	x	x	x	2
	Expectations	x	✓	✓	✓	x	x	3
Impact on Staff	Workload	✓	x	✓	x	x	x	2
Know How	Support	✓	x	x	x	✓	✓	3
	Training	x	✓	✓	x	✓	✓	4
	Sharing best practices	x	x	✓	x	x	x	1
System	Performance	✓	✓	✓	x	✓	✓	5
	Usage	x	x	✓	x	✓	x	2
	Usability	x	✓	✓	x	✓	x	3
Impact on Business Processes	Programme management	✓	x	x	x	x	x	1
	Total	4	5	8	1	5	3	26

Table 5-9: Consistency of Interest in Criteria Across All Iterations by Stakeholder Groups

The group with the greatest consistency levels are the operating core with their prime concerns being the impact on students, gaining knowledge about the system and their interaction with the system. The stakeholder group with the least consistency is the Strategic Apex with only one criterion being consistently of interest to them throughout this research project. No single criterion had interest from all stakeholder groups across all iterations. However, system performance was of interest to five groups for each iteration making this the criterion with the greatest shared interest. This could be due to the problems with the system that were experienced by the users throughout the course of the research and may be an example of how the day-to-day life of the stakeholders had an influence on their criteria selection. If the system's performance was not so visible to the user then maybe this criterion would not have appeared time and again as the 'black box' effect would have allowed the stakeholders to take the performance of the system for granted (Tatnall & Gilding, 1999).

In any longitudinal study where stakeholder groups are used to collect data, panel conditioning or attrition may occur (Ruspini, 2002) due to the repeated nature of the research with the same participants. Panel conditioning, for this

research, is unlikely due to the nature of the data collected being attitudinal and not knowledge based (Das et a.l, 2011). Panel attrition also did not occur as it was not an absolute requirement to use the same participants year-on-year. The requirement of this research was to use representatives from each stakeholder group. In some cases this included the same people, but in some it did not and if any drop-out occurred, alternative participants were available.

Consistency of ideas, however, was experienced in this research project and so may have been due to: the use of the same stakeholder groupings; some of the same people from the stakeholder groups being involved in the collection process where their 'technological frames' (Orlikowski & Gash 1994) may not have changed over time; or the evaluation criteria for each group does indeed clearly represent the most important issues for the different stakeholder groups.

In recognition of the persistency of ideas by stakeholders, intervention in the process to collect stakeholder requirements was considered necessary. Whilst stakeholders may have been exposed to the results of the evaluations through MMU's committee structures and engagement with project communications, there were no direct communications disseminating outcomes to them. At the start of the (group) interview in the third iteration, some evaluation results were fed back to the group (See Appendix E). The feedback mainly centred on the students' evaluation results to find out whether the ideas presented as feedback would influence the stakeholders' thinking in terms of their requirements for evaluation. Obviously some stakeholder groups consistently expressed an interest in the student categories from the start but there had been a general waning of interest in criteria based around the student. The results were well received and the stakeholders found them interesting. However, when the stakeholders presented their ideas on what criteria they considered important to them, the feedback did not appear to have an impact on their thoughts. The level of interest by stakeholder group for issues surrounding students is shown in Table 5-10. There was a rise in interest in Retention and Progression but as

previously mentioned this had become an agenda item within the university and so the observation could be explained by this.

Criteria	Iteration 1		Iteration 2		Iteration 3	
	Number	Stakeholder Group	Number	Stakeholder Group	Number	Stakeholder Group
Experience	6	CH, ML, OC, SA, SS, TS	4	CH,ML,OC,SA	2	ML, OC
Expectations	6	CH, ML, OC, SA, SS, TS	4	CH,ML,OC,SA	3	ML, OC, SA
Culture	2	CH, OC	1	SA	1	ML
Success	2	CH, SA	1	ML	4	ML, OC, SA, TS

Key: CH=Champions; ML=Middle Line; OC= Operating Core; SA= Strategic Apex; SS= Support Staff; TS=Technostructure

Table 5-10: Level of Interest from Stakeholders in Student Issues

It was interesting to see that the primary concern for the stakeholder groups in the main coalesced around the system and users' know how. This is an interesting observation as it suggests that stakeholders appear to be, in the main, primarily interested in those aspects of the system that directly affect them. It means that making improvements to the system and users' knowledge accordingly will have a direct impact on the areas the stakeholders are most concerned about. The stakeholders had now had three years' experience of the system and as such had expressed views for those three years that they were unhappy with the usability and reliability of the VLE in use. It was no surprise therefore that the same criteria regarding the system emerged in the second and third iterations. In the third iteration however a further criteria of systems requirements emerged. The licence for the VLE in use was under negotiation and university-wide research was being conducted to find an alternative. The stakeholders were undoubtedly aware of this fact and so wanted requirements to form a part of the evaluation process.

5.3.1.4 Using a Stakeholder Approach

The validity of using a stakeholder approach to evaluation in this way could be born out with the emergent criteria from the stakeholder analysis. These criteria arise as a result of the direct effects the technology has on the lives of the stakeholders within the institution. Day by day, the system impacts on the working lives of these people and so, by taking an approach such as this, it is the people who impact on how this system is measured. When the system

lets them down, they want to learn about that aspect of the system and understand it in a little more detail and maybe desire the system to be held accountable for its inadequacies. One example of this could be when academic staff ran multiple choice summative assessments via WebCT. The system failed which resulted in this becoming an issue for system performance in the evaluation. This not only comes from the academics' (Operating Core) perspective but also from the students (Operating Core) themselves, from the programme administrators (Support Staff), from heads of departments (Middle Line), from Deans (Strategic Apex) and from those whose role it is to embed the system into everyday life and encourage its use (champions). In other words, a whole spread of stakeholders who are responsible for, or receive, the teaching and learning delivery in a UK HE institution are involved in, and impacted upon on a day-to-day basis in multi-faceted ways.

The tool that was used to assist the data collection was that of mind mapping and it is this that will be reflected upon in the next section.

5.3.1.5 Mind Mapping as a Qualitative Analysis Tool

There is evidence within the literature of the use of cognitive maps as a qualitative analysis tool. It has however been used in different circumstances to that detailed within this research project. From a review of the literature, Swan (1997) discusses creating conceptual maps at individual, group and organisational level through the use of two-dimensional grids. These were used to investigate cause-effect beliefs in different contextual settings (Swan, 1997). This aspect of their use is different to the use within this research, where content analysis (Swan, 1997) was the intention. However, researching the way in which Swan (1997) has used mind mapping within their research context has provided a useful background to this research project. This is due to the literature discussing bringing data together from individual to group to organisation level (Swan, 1997) in much the same way as has been done here.

Another difference in the use of conceptual mapping within this research is in the way content analysis was used. The content analysis discussed within

the literature focused on its use with interview scripts and documents (Swan, 1997) whereas with this research project the maps were constructed straight from the recorded spoken word in the first iteration and 'on the fly' in the group interviews. This was because the themes that were discussed within the interviews were seen as important rather than analysis of the dialogue used. Further research needs to be conducted regarding using these useful techniques.

5.3.2 Summary

This section has carried out a detailed analysis of the stakeholder requirements to evaluating an MLE. A rich set of data has been produced which tracks the stakeholder interest across three iterations; three full academic years. This timeframe takes the system under study from one in its infancy, as a pilot, through to a large-scale, university-wide system and it tracks the stakeholder evaluation requirements throughout. The evaluations invariably had an impact on the host institution and it is this impact that will be discussed next.

5.4 Impact of MLE Evaluation on the Institution

5.4.1 Impact on the MLE Model

The MLE model developed by the Project Team was used in each evaluation iteration. At each iteration, the model was reviewed in light of the findings of the evaluation process. Each iteration is considered.

For iteration 1, in carrying out the comparison of the stakeholder analysis with the project model, it became apparent that the project model for the project was not flexible enough to cover all stakeholder expectations. It was proposed that the MLE Project Board modify the definition.

The project model was found to need updating in two places as presented within the results chapter.

The revised project model allowed for flexibility in the evaluation process due to the inclusion of a provision for tracking the needs of the stakeholders and ensuring their expectations were met.

Taking the analysis from the inverse position, point 8 on the MLE project model, migration of existing assets from any existing platforms to WebCT Vista, was not mentioned by any stakeholder. This may indicate a need to educate stakeholders as to the value of e-assets and the need for the e-assets to be managed. This may become an issue in any future communication and training agendas involving different stakeholder groups.

The second iteration used the revised project model. In making comparisons with the stakeholder analysis no further adjustments were needed and all criteria raised by the stakeholders were successfully mapped. One issue from the Project Model was not covered by the stakeholder analysis. This is point 13:

- 'defining appropriate indicators of project success and risk exposure and monitoring them objectively.'

The lack of interest in this aspect could be due to the stakeholders not being concerned about the project itself due to their exposure to the project and them having a trust in the processes already in place. The criteria developed as part of this research involved them in deciding upon appropriate indicators to success and so they understood that they are part of the process in determining these indicators. This may have re-enforced the trust they felt.

The third iteration, again, successfully mapped all stakeholder criteria but found that a number of points from the MLE model were not considered. These were points 1, 2, 7 and 12. Namely:

Point 1. 'establishing effective project governance, reporting, document handling, progress monitoring, escalation and team working arrangements'

Point 2. 'establishing effective communication with all project stakeholders'

Point 7. 'migrating existing assets to WebCT Vista and establishing procedures for managing e-Learning assets that optimise local ownership, reduce duplication and enhance quality and consistency'

Point 12. 'defining appropriate indicators of project success and risk exposure and monitoring them objectively'

As the project progressed the evaluation criteria have, as has been seen already, centred primarily on the aspects of the MLE that concern stakeholders on a day-to-day basis. Therefore it is no surprise that as time

progressed they became less interested in the wider issues about the project. In line with previous discussion, maybe the stakeholders took for granted aspects of the project, and so would be less likely to recall them when asked for their views on evaluation criteria. This could be the case with communication with stakeholders. Through various committees and written communications disseminated through various media, the stakeholders are exposed to issues surrounding the project and so this could explain the lack of interest in points 1, 2 and 12. As for point 7, regarding migration of assets, no further VLE existed by the third iteration and so this would not be an issue for anyone. Indeed, had MMU not been moving learning platform a recommendation from the third iteration would have been to remove this from the project model.

5.4.2 Artefacts Produced

The artefacts produced as a result of the Problem Solving Interest cycle and discussed here are the Stakeholder Expectation Model and the Evaluation Plan.

5.4.2.1 Stakeholder Expectation Model

A Stakeholder Expectation Model was produced each year as a result of the stakeholder analysis. The model showed clearly the different categories and criteria that the stakeholders thought were important for evaluating the MLE. The development of the Stakeholder Expectation Model, through feedback from interested parties, proved to be accessible to any audience where an understanding of the evaluation issues is required. An example of a Stakeholder Expectation Model can be found in Figure 5-13.

Figure 5-13: Example Stakeholder Expectation Model - 0809

Consistent with the philosophical underpinnings of this research, the Stakeholder Expectation Model was built from the researcher's interpretation of stakeholders' requirements from interviews and the researcher's analysis of those interviews. Whilst validation at individual level allowed for individuals' views to be confirmed in the first iteration, once the groups maps were constructed the researcher's interpretations of meaning were used. This could result in individual meaning being lost as assumptions were made about meaning in order to construct the stakeholder groups' mind maps and, consequently, the organisational level mind map. In the second and third iterations however, the mind maps were constructed dynamically with the stakeholders and were projected onto a large screen for all to see within the session and consequently distributed. This may have reduced the issue of meaning being lost but it would be outside the scope of this study to have ensured that meaning by the individual actors was consistent, especially when stakeholder views were brought together in the first iteration, and that the meanings held by individuals held true. This could form the basis of further research using hermeneutic and interpretivist philosophies as a base (Crotty, 2005).

5.4.2.2 Evaluation Plan

The Evaluation Plan is the artefact that lays out: the evaluation metrics; and sources of data. Instead of concentrating on the criteria most popular with the majority of stakeholders, it was deemed appropriate, in the first iteration, to have a 'light touch' approach across all criteria. This was the first time the evaluation on an institution-wide basis had been carried out and by taking the 'light touch' approach it gave the stakeholders and management the opportunity to learn about the system from all perspectives. This approach changed once reflection of the first iteration was completed and knowledge about the system increased.

One of the problems with taking this evaluation approach, however, was the large number of criteria on which the evaluations are based. In the early stages of development of the plan, the researcher was struggling with the vast amounts of information contained within the plan and so being able to see the 'whole picture' was problematic. However, once the plan had been developed onto a single sheet of paper, the evaluation became manageable. An example of the Evaluation Plan from the first iteration can be found in Figure 5-14.

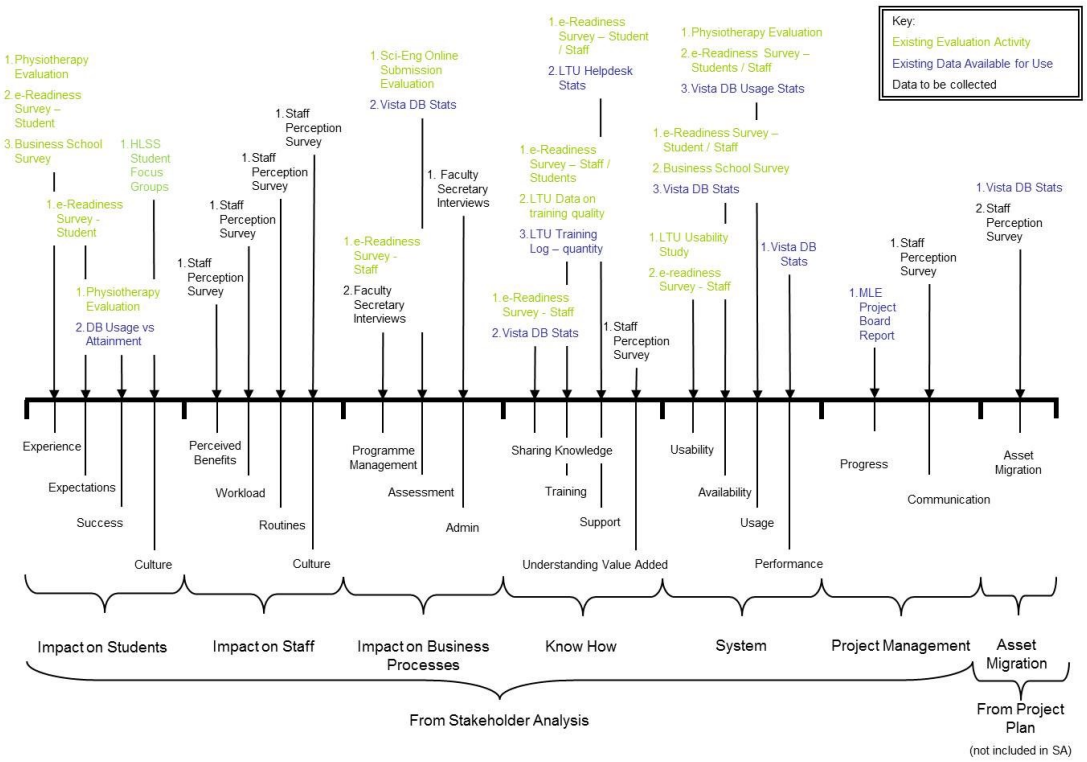


Figure 5-14: Example Evaluation Plan

The Evaluation Plan laid out in this way offers a parsimonious, accessible, comprehensive layout which affords the evaluator a simple reference point for what is a complex situation. In future iterations, the decision was taken to limit the number of criteria to be evaluated. This was a very pragmatic decision based on the availability of resources. This meant that not all criteria were included within the evaluation process and so simplified the Evaluation Plan.

5.4.3 Impact on the Future of the MLE at MMU

Towards the end of this research project MMU decided to undertake a major review of the technologies used to support learning. The intention in September 2009 was to move to a new 'front end' portal and to bring further MMU systems under the umbrella of the MLE. The current VLE was also up for renewal as the licence on the existing system was due to expire in August 2011 and so plans needed to be made regarding whether the existing system was going to be taken forward or a complete change made.

The results of the MLE evaluation generated by this research project helped shape the decision making process. Within the education community, there has been a call to move away from a VLE towards alternatives such as a PLE (Personal Learning Environment) (Wilson et al., 2006) or DLE (Distributed Learning Environment) (Sclater, 2011). These were based on arguments that the VLE does not fit with today's connected world and that the learner is disadvantaged by the restrictions placed on them with the VLE being within the boundaries of the institution. The results of the evaluation showed however that the use of the VLE does assist students' progression and that students like the flexibility it affords them and so urged caution for the institution in moving away from this technology. This has resulted in the purchasing of a new VLE at MMU to replace the existing one in September 2011.

5.4.4 Conclusion

Taking a stakeholder perspective has allowed the whole project to be more inclusive in its approach, with the stakeholders' needs playing an important role in devising the criteria for evaluation. This is consistent with the finding from the literature review where identifying stakeholder needs is seen as paramount to the success of an evaluation project (Serafeimidis & Smithson, 2003; Williams, 2002; Bullock & Ory, 2000; McNaught & Lam, 2005).

5.5 SUMMARY

This chapter has provided an opportunity to analyse and discuss the results from Chapter 4. The results and subsequent analysis and discussion looked at both aspects of the dual cycle independently; namely the Research Interest cycle and the Problem Solving Interest cycle. The frameworks used to operationalise these dual aims worked well in practice and made a significant contribution to keeping the research project 'on track'. The Problem Solving Interest cycle produced practical results, which were discussed in detail. Each Research Question was dealt with separately and discussed with recommendations made accordingly.

Chapter 6: CONCLUSIONS

This study has provided the opportunity to assess the use of SSM as an evaluation framework to deal with the complexity of evaluating an MLE in a UK HEI. The literature review coupled with the review of MLEs, found that in selecting a framework for evaluation a number of criteria needed to be met. The framework needed to be able to:

- capture the locally situated version of an MLE
- handle the wide variety of stages of development
- cope with the complexity of a system that has an unspecified number of variables
- identify and encompass stakeholders' needs to strengthen results utilisation
- and to understand why certain phenomena have been observed.

As discussed in Chapter 2, this study was designed to answer a number of research questions:

Research Question 1	How can an institution evaluate its MLE?
Research Question 1a	Can SSM provide a suitable framework for evaluating an MLE?
Research Question 1b	Do the Measures of Performance (5Es) encompass all the evaluation criteria, based on stakeholder expectations, for an MLE in UK HEIs? If not, what adjustment to the Measures of Performance would contextualise them to MLEs in UK HEIs?
Research Question 2	How should stakeholders be identified and what are their evaluation requirements?

In answering these research questions this thesis contends that SSM coped with the criteria demanded of it in the literature and provides a suitable framework for evaluating major information systems in UK HEIs. There is some case for adjusting its standard measures of performance for the context of an MLE due to lack of stakeholder interest in evaluation of the ethical dimension but further research with other institutions would be needed in order to confirm this.

The framework for stakeholder identification proved suitable as it facilitated holistic representation of key MLE stakeholder views. It was highlighted within the literature review that the stakeholders needed involvement in the evaluation process in terms of finding out what they were interested in knowing about the system under study. The stakeholder analysis allowed this to happen and a picture emerged of the areas of interest from these stakeholders. There was evidence that the stakeholders cared about those things that affected them on a day-to-day basis but they were also influenced by University priorities in determining their criteria for evaluation.

6.1 Key Points from Research

A number of key points have emerged from this research, which would be of interest to others contemplating carrying out evaluations of an MLE in a setting such as the one experienced here. These are:

- map the internal stakeholders groups to the Farbey et al. (1993) framework to ensure an holistic view of the system
- use group interviews as the means of gathering stakeholder evaluation criteria but recognise that for some groups this will not be suitable and so individual interviews will be required

- use mind maps to capture the thoughts and ideas raised within the interviews at the time of the interview and project these onto a large screen for all to see
- create group and organisation level mind maps by amalgamating relevant maps
- determine the high level criteria from the organisation level mind map and use this as the guide for evaluation metrics
- develop an Evaluation Plan on a single page to aid conceptualisation of the requirements and include the evaluation criteria and the data sources within the plan
- use existing data sources, where available, to answer evaluation questions
- use Random Forest Analysis to analyse large datasets

A number of contributions to research have been made during the course of this study and it is these that will be considered in the next section.

6.2 Applicability of Evaluation Framework to Other HEIs

An argument has already been made that the Evaluation Framework is inherently flexible. Emphasis on process, stakeholders and an explicit model of the system being evaluated facilitates transferability of the approach. Another institution may wish to draw its system boundaries to include technologies not provided by the institution, such as so-called web 2.0 tools. Steps 1 and 2 in the evaluation process require the scope of the evaluation to be made clear to all stakeholders up-front, so the approach would be equally suitable to a wholly-institution provided MLE or a hybrid of institutional and personal technologies. The key is to be explicit about the scope of evaluation up-front, and to follow through the process cycles to gather useful evaluation data.

6.3 CONTRIBUTION TO FIELD OF RESEARCH

This research has made a number of contributions to the field of IS research in education.

6.3.1 Methodological

6.3.1.1 SSM as an Evaluation Tool

SSM is a tried and tested methodology used for social science research in a wide range of contexts (Checkland, 2000). It has previously been used as an evaluation tool within the NHS in the UK (Rose & Haynes, 1999) but not within the context of higher education.

In the context of this research project, SSM has proved to be a useful evaluation tool providing a framework for thinking about the process of evaluation. By using this methodology as the framework for evaluation: it gave voice to stakeholders in the evaluation process; it allowed for an indefinite number of variables to emerge from stakeholders' expectations; it dealt with the locally situated MLE; and was flexible enough to be relevant at every stage of development of the MLE at MMU from pilot through to end of life maturity.

In other words, SSM successfully took account of the varied requirements of an evaluation framework as highlighted within the review of existing literature and MLEs in situ in Chapters 1 and 2 and summarised earlier in this chapter. The framework embraced stakeholder expectations and as such a wide variety of evaluation criteria emerged. The evaluation criteria together formed a holistic view of the MLE taking hard (e.g. availability of the system) and soft (e.g. impact on culture for students) issues into account. The research took a multi-method approach to carry out these evaluations in order to appeal to stakeholders. As was pointed out in the literature review, stakeholders in education come from a wide variety of backgrounds and take value from differing forms of data and analysis (Oliver, 2000).

Any evaluation framework needs to be flexible in order to take account of the many and varied issues that arise when evaluating a university wide system such as an MLE. SSM's strength, in this context, is its ability to be flexible and to provide the evaluator with a set of tools to ensure that each aspect of the evaluation is accounted for and thought about throughout the course of the evolution of the system. Its iterative nature suits perfectly the iterations required to carry out longitudinal evaluation, such as that performed here.

6.3.1.2 SSM Measures of Performance in Education Context

Mapping the evaluation criteria extracted from the stakeholder analysis and the requirements of the project, showed that the measures of performance provided coverage of all the points raised and so no additional measures needed to be introduced. There was, however, the need for adjustment as one of the measures, ethicality, was not raised through any of the lines of enquiry that led to the production of the evaluation criteria. It was recognised however that it would be premature to remove this dimension completely and so this dimension has been demoted in priority.

The measures of performance suggested by Checkland (2000) have been contextualised to an MLE in a UK HEI. The adjustment proposed within this study begins to contextualise SSM to institution-wide IS evaluations in the HE sector. This research project however has only been conducted at a single HE institution. The contribution to knowledge in this area will only grow as further iterations of this research are completed in other institutions.

6.3.1.3 Adjustment to Evaluation Framework

The evaluation framework adopted for this study was originally developed by Rose & Haynes (1999) during their evaluation study within the NHS. Whilst this model provided a suitable framework for evaluation, it did not ensure that stakeholders needs and expectations were taken account of within the evaluation process. The model was therefore adjusted with the inclusion of a full stakeholder analysis in the evaluation process at step 2 (Figure 3-4: Model to Evaluate MLE (adapted from Rose & Haynes, 1999)).

6.3.1.4 Use of Farbey et al. (1993) Stakeholder Map

The use of the stakeholder map (Farbey et al., 1993) to identify internal stakeholders for the MLE was a success. The final mappings allowed for a holistic view of the MLE, through the various stakeholder groups used to elicit stakeholder requirements for evaluation criteria, within the stakeholder analysis. A suggested adjustment to the map has been made based on contextualising it to an Information System used in a UK HEI (Figure 5-5).

6.3.1.5 Dual Cycle Action Research

The dual Action Research cycles (McKay & Marshall, 2001) adopted for this project were very helpful in conceptualising the different aspects of the research and keeping track of progress in both the Problem Solving and Research Interests cycles. Indeed not only did they help in conceptualising the project but also in writing up this thesis.

There was an initial difficulty in seeing how the AR cycles were going to work when operationalising the research. By using the Dual Cycle, there was real value in keeping the two distinct but interwoven aspects of *Action* and *Research* separate. The project was complex with many components and using the dual cycle assisted the researcher in ensuring that all aspects of the project were considered at the appropriate time. It gave each aspect of the research its own importance within the research context and ensured that neither the Problem Solving nor the Research Interest cycles were given priority over the other.

In undertaking the practical elements of research that is ‘on the ground’, it is easy to become immersed in this as it demands time and attention to fulfil the requirements of a role. By having the dual cycle playing in the background it brings the research elements to the fore and guards against this important element becoming lost in the process.

6.3.1.6 A Holistic Evaluation Process

The process followed for the evaluations was adapted and adjusted over time, in view of the iterative nature of this research project. The methodology adopted for the evaluation process had a number of elements to it:

- using Rose & Haynes (1999) SSM evaluation framework
- using the stakeholder map (Farbey et al., 1993) for stakeholder selection
- developing stakeholder requirements and mapping these to the project definition
- developing the evaluation metrics by resolving the stakeholder-based and project-based agendas
- developing the Evaluation Plan based on these metrics recognising that secondary data from existing research projects across the institution may result in data that brings value to the evaluation and is then simply supplemented as required by empirical research
- taking a pragmatic approach to methods used for both collection and analysis of evaluation data

This methodology taken as a holistic approach to evaluation has been found to be successful in evaluating an MLE. It affords parsimony in the evaluation process, especially in the area of data collection and analysis due to the use of existing data generated by other researchers within the institution. This brings efficiencies in the resource requirements, especially on the part of the research team and the efforts required by them to carry out the evaluations.

6.3.2 Methods

6.3.2.1 Multi-Method Approach

Numerous methods were utilised to complete this research project. These were at two levels: the collection of information for the evaluation process such as gathering information on which to base the evaluations; and the actual evaluations themselves.

Some of these methods are tried and tested research methods used in circumstances widely recognised as being appropriate. Two, however, were not.

Random Forest Analysis

Random Forest Analysis has been used within the natural science disciplines, such as research into genetics (Bureau et al., 2005) and the environment (Parkhurst et al., 2005), but not within the social science context of this research study. It is used to analyse large datasets and was a perfect analysis tool for the huge datasets generated by the evaluation process. It allowed the data generated by each student, over 200,000 individual variables, to be analysed and for patterns of behaviour to emerge. The information generated by this analysis helped shaped the future plans of the institution in its decision making process regarding its VLE (see for instance http://lrt.mmu.ac.uk/ltreview/2010/01/06/how-weve-used-vista-since-2006/).

The use of an analytical tool such as Random Forest Analysis is an innovative feature of this research. Since this research was conducted, interest in leveraging value from large datasets held in education institutions has grown. This is due to a number of reasons; the recognition that value can be extracted from existing large datasets; the need to understand how this perceived value can be extracted; the acknowledgement that the increased data collected due to the growth in the use of online learning could be optimised for improving the learning process; and the increasing demands on educational institutions to 'measure, demonstrate and improve performance' (Ferguson, 2012).

The term 'Learning Analytics' (Ferguson, 2013) has emerged as a way of describing this type of activity. A definition of Learning Analytics offered at the first Learning Analytics and Knowledge Conference in 2011 is:

> *"Learning Analytics is the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of*

> *understanding and optimising learning and the environments in which it occurs" (LAK, 2011)*

This definition encompasses the concepts of a need to understand our learners in order to improve their student experience and ultimately to 'optimise' their learning. The use of Random Forest Analysis, as used in this research, contributes to the of start this process.

Mind Maps as a Qualitative Analysis Tool

Using cognitive mapping in social sciences is widely recognised but has not been used within the specific context that it was used in this study. It was used as a method of gathering data from stakeholders within focus groups. This proved very useful as the data collection was about gathering high level, non-hierarchical ideas from the stakeholders and feeding these ideas back to the group for the purposes of validation. The cognitive maps therefore had to fulfil two purposes: a data collection tool for the researcher whereby the data could be later analysed; a feedback mechanism to the stakeholders regarding ideas generated by the group.

Feedback about its use from the stakeholders was very positive. A selection of the feedback comments are:

> "..I rather like the mind-map way of presenting data."

> "I do like the way that you have analysed the data and feel that it neatly encapsulates the way I was thinking. Purely by coincidence, I am teaching the part-time MSc Research Methods group… and the topic is analysis of qualitative data…. I wonder if you would mind me using your analysis of our conversation as an exemplar? It is usefully short and to the point so would make good discussion point."

> "Mind Map looks good…."

> "Very succinctly expressed!"

These comments highlight the strength of conceptual mapping as a way of capturing data that is required and then feeding it out to interested parties.

This demonstrates that it meets the needs of multiple audiences and has been a useful tool for this research project.

6.3.2.2 Stakeholder Expectation Model

The process of highlighting the evaluation stakeholders, and understanding what they want from the evaluation process, has been discussed in the literature as imperative to the success of evaluation studies. Whilst the literature addresses the identification of the stakeholders (Farbey at al., 1993), no literature was found that highlighted the evaluation issues deemed important by this critical group. The development of a locally situated Stakeholder Expectation Model, as shown in Chapter 3, fulfils this requirement. Even though it has been shown throughout the three iterations that no two models are the same year-on-year due to the ever-moving nature of the subject under study, it is none-the-less an important model in the field of stakeholder involvement in the evaluation process for MLEs in UK HEIs.

At MMU, core criteria appeared to be consistent across the three iterations and only further work would confirm the emergence of these core criteria in other institutional settings. These together are proposed as forming the basis of comparison for evaluations in alternative settings. Further research into this area would confirm whether these consistent criteria held true in other institutions.

6.3.3 Impact of Social Science Research

6.3.3.1 Strategic Decision Making

This research project was undertaken to provide MMU with an evaluation framework for evaluating its newly introduced MLE. No evidence of previously developed frameworks was apparent and so a longitudinal action research project to test SSM in this context was designed. Longitudinal research of this nature is rare due to the funding issues ever present in HE. It is an expensive process and so the opportunity to carry out a three year longitudinal study of this nature is uncommon.

In undertaking this research, the results of the evaluations had a direct impact on the strategic direction of the VLE at MMU. The current system was nearing the end of its life due to a requirement to renew the licence. External research (Wilson et al., 2006; Sclater, 2011) indicated alternative Learning Environments as a way forward. However, the findings from the Random Forest Analysis, carried out within this research, suggested caution. It showed that there is value in a VLE and when used in the 'right' way, it had a real impact on students' success. Therefore, instead of abandoning a VLE, the institution decided to invest in the purchase of a new VLE to be the e-learning element of its MLE.

6.4 SUMMARY

The purpose of this research was to propose a framework by which MLEs in UK HEIs could be evaluated. The evaluations are a requirement in gaining a greater understanding of the system in use within a host institution. It was recognised that any framework proposed within this research would need to be flexible enough to deal with the complexity and variability of an MLE, if it was to be transferable to other institutions.

Whilst SSM has been used in a wide range of social science research (Checkland, 2000), it has not been used previously for the evaluation of a MLE in a UK HEI. Within this context, however, SSM proved capable. It allowed the researcher to focus on the process of evaluation and took the evaluator systematically through the evaluation process. Practical issues to assist other researchers or practitioners carrying out evaluations arose throughout and have been documented earlier in this chapter as key points.

Due to this research being a PhD, it gave the opportunity to carry out a longitudinal study; a resource intensive, expensive methodology (Ruspini, 2002; Kohli & Devaraj, 2003). Chen & Hirschheim (2004) found that cross-sectional studies are often favoured over longitudinal but in choosing this methodology, it has afforded the opportunity to observe the process and changing stakeholder views over a three-year period. This is vital when the

research needed to track changes to variables (Kaplan & Duchon, 1988) and when the focus of the research is on process (Chen & Hirschheim, 2004). Over the period of this research project, the MLE matured from a pilot to one that reached the end of its life and longitudinal research allowed for the lag effect (Chan, 2000; Kohli & Devaraj, 2003) of the learning and adjustment experienced by stakeholders of any newly implemented information system (Brynjolfsson, 1993).

The landscape of people and systems in UK HEIs is ever changing and methods, methodologies and frameworks proposed for evaluation of the IS system used for learning and teaching, needs to reflect this. This research has found a way of successfully bringing these elements together. By bringing together a multi-method approach using longitudinal AR and a framework that has the ability to cope with the changing landscape of people and systems, it is possible to successfully evaluate a large scale IS system in UK HEIs.

Chapter 7: FURTHER RESEARCH

Throughout the course of this research, areas of possible further research have been highlighted.

From an evaluator in practice perspective, were the research to continue, the action plan for the next iteration would be to:

- continue utilising the pragmatic approach to data collection for gathering stakeholder requirements with particular recognition of those groups unsuited to group interviews
- continue with the logic for criteria selection for evaluation
- further develop the analysis methods in order to provide detailed analysis of unexpected high level relationships, such as the issue surrounding staff activity in resources negatively affecting student progression.

There are however wider issues for further research as detailed in the next sections.

7.1 DETAILED FURTHER RESEARCH

7.1.1 Clarify Findings on Measures of Performance Dimensions

A finding of this research was the lack of evidence regarding stakeholder interest in Ethicality as a dimension of a measure of performance of the MLE. As was discussed in Chapter 5, this dimension could be implicit in the meaning of what was said by the stakeholders but was not, at any point, made explicit by the stakeholders. Further research would be needed to explore this issue and to gain a deeper understanding of the stakeholder requirements. This would allow an understanding to be gained about whether the dimension of ethicality would be excluded from the measures of performance when contextualised to UK HEIs.

7.1.2 Stakeholder Voice

Questions were raised about the stakeholder voice once the research changed from individual interviews to those held in groups. Whilst measures were put in place to avoid this, it is unknown whether this affected the views expressed by the stakeholders and only further research would allow this issue to be explored further.

7.1.3 Stakeholder Enthusiasm

As was discussed in Chapter 5, stakeholders appeared to be less interested in the validation exercise post group interview than they had been when the interviews were individual. A number of reasons why this behaviour might have been observed were discussed but only through further research could the reasons be explored further.

7.1.4 Stakeholder Numbers

Whilst no evidence existed in the analysis of this research that fewer stakeholders involved in the gathering of evaluation criteria resulted in less contribution from that group to the final evaluation criteria overall, only further research would allow a greater understanding of this. This could look at whether there is an optimum number of stakeholders needed to truly represent the requirements of an individual stakeholder group. In research where the stakeholders are central to building the evaluation criteria, there needs to be certainty that their views are fully represented in order to ensure the evaluation study that follows appeals to the stakeholder groups as a whole.

7.1.5 Understanding Stakeholder Priorities

This research did not explore priorities in the evaluation criteria as each criteria raised were treated with equality and so no hierarchy of criteria was formed. However, when resources are an issue and recognition that not all criteria can be evaluated, stakeholder views on the most important issue to them would need to be formulated. As has already been discussed, the groups were not asked to consider what the most important issues were and so no conflict was experienced within the groups themselves. Further

research would therefore be needed regarding using alternative techniques to elicit the final requirements.

7.1.6 Stakeholder Meaning

Further research into the meaning ascribed by stakeholders to the criteria for evaluation would be a further interesting addition. As has already been pointed out in the discussion chapter, this would give further insight into the criteria considered important by the stakeholders and the meanings ascribed to them. This would reduce the impact the researcher had on the evaluation criteria by taking out their interpretations of meaning when the stakeholder analysis was completed.

7.1.7 Clarify the Core Evaluation Criteria in Other Institutional Settings

It was found at MMU that the core criteria for evaluation appeared to be consistent across the three iterations of this study and these are proposed as forming the basis of comparison for evaluations in alternative settings. Further research into this area would confirm whether these consistent criteria held true in other institutions.

7.1.8 Developing the Learning Analytics approach

This study pioneered the joining of data about VLE usage, student demographic and student attainment to shine light on links between VLE use and student success and progression. Since this study was undertaken, interest in this area has grown rapidly and developing the joining, categorisation and random forest analysis techniques used in this project will definitely be on the agenda for further research.

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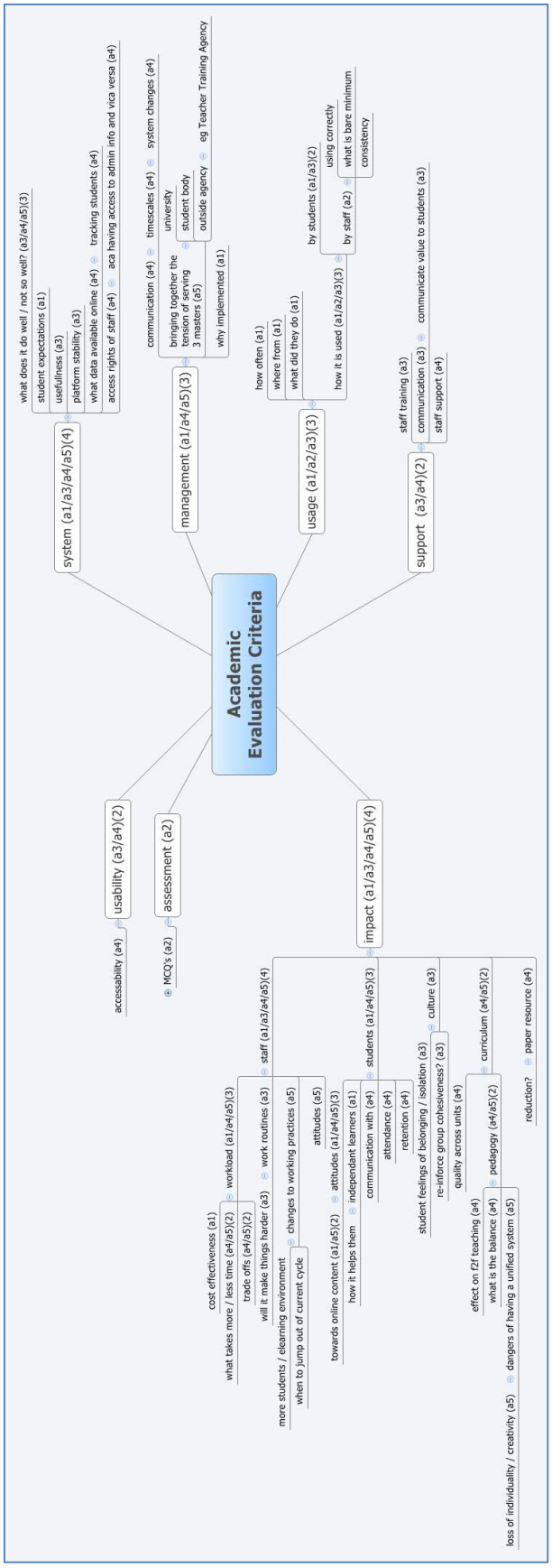
APPENDICES

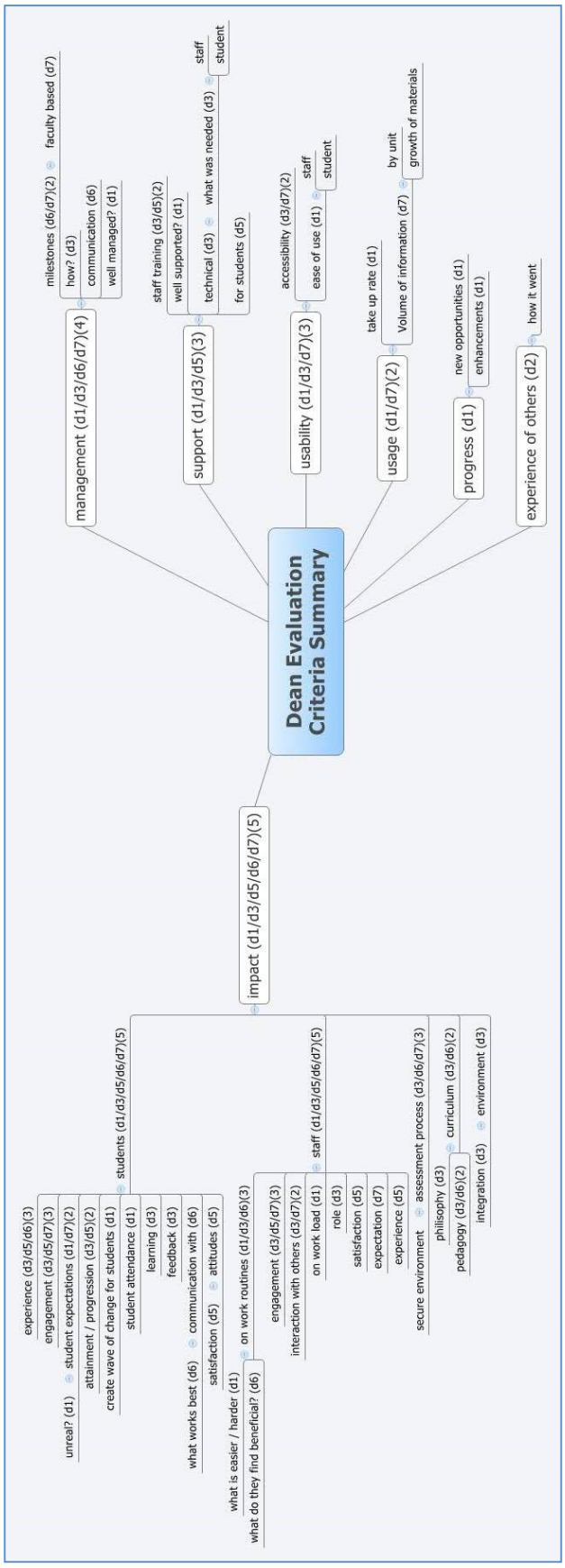
APPENDIX A - MIND MAPS FOR ITERATIONS 1, 2 AND 3

The following pages contain the group and organisational level mind maps for the three iterations.

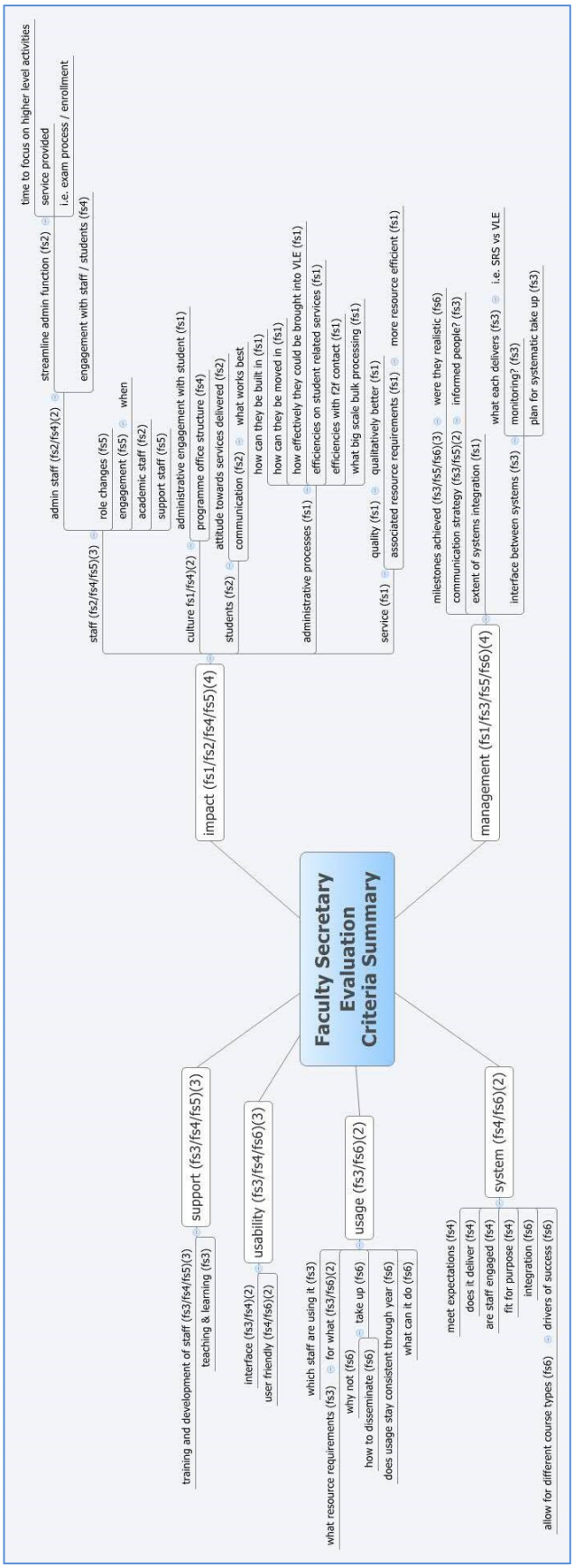
Iteration 1 - *Academic Group Map*



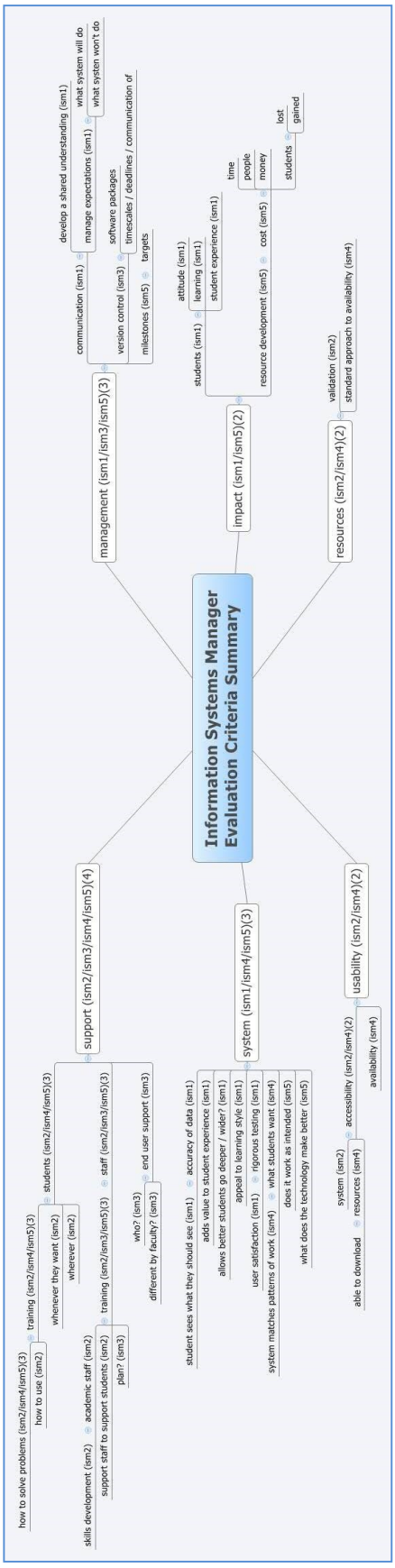
Iteration 1 - Dean Group Map



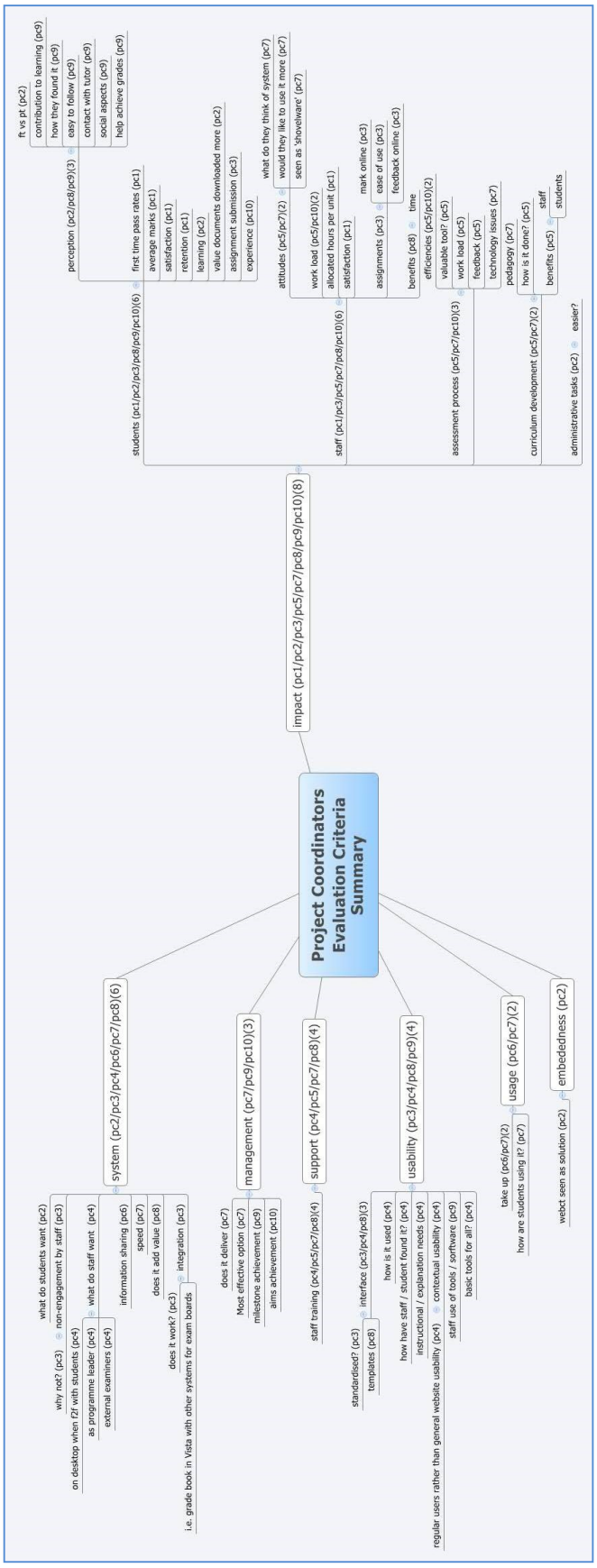
Iteration 1 - Faculty Secretary Group Map



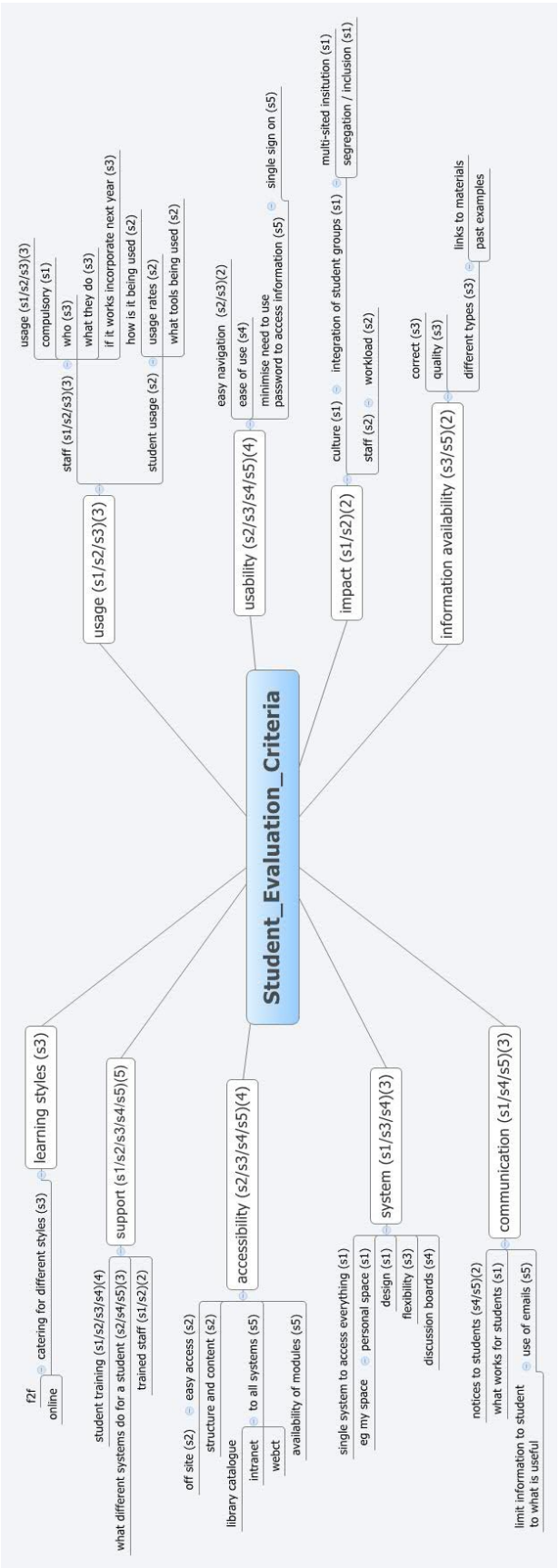
Iteration 1 - Information Systems Manager Group Map



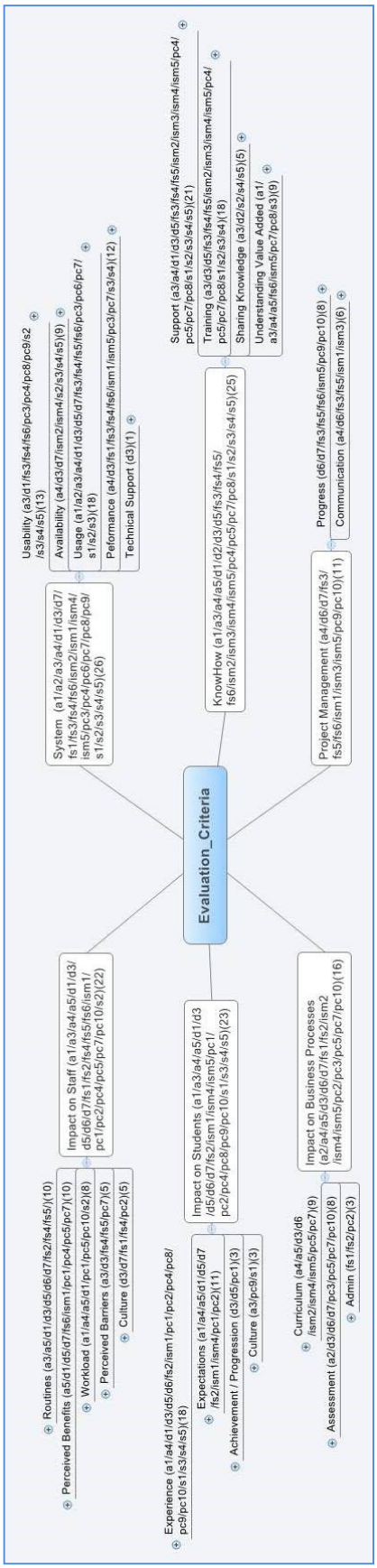
Iteration 1 - Project Coordinator Group Map



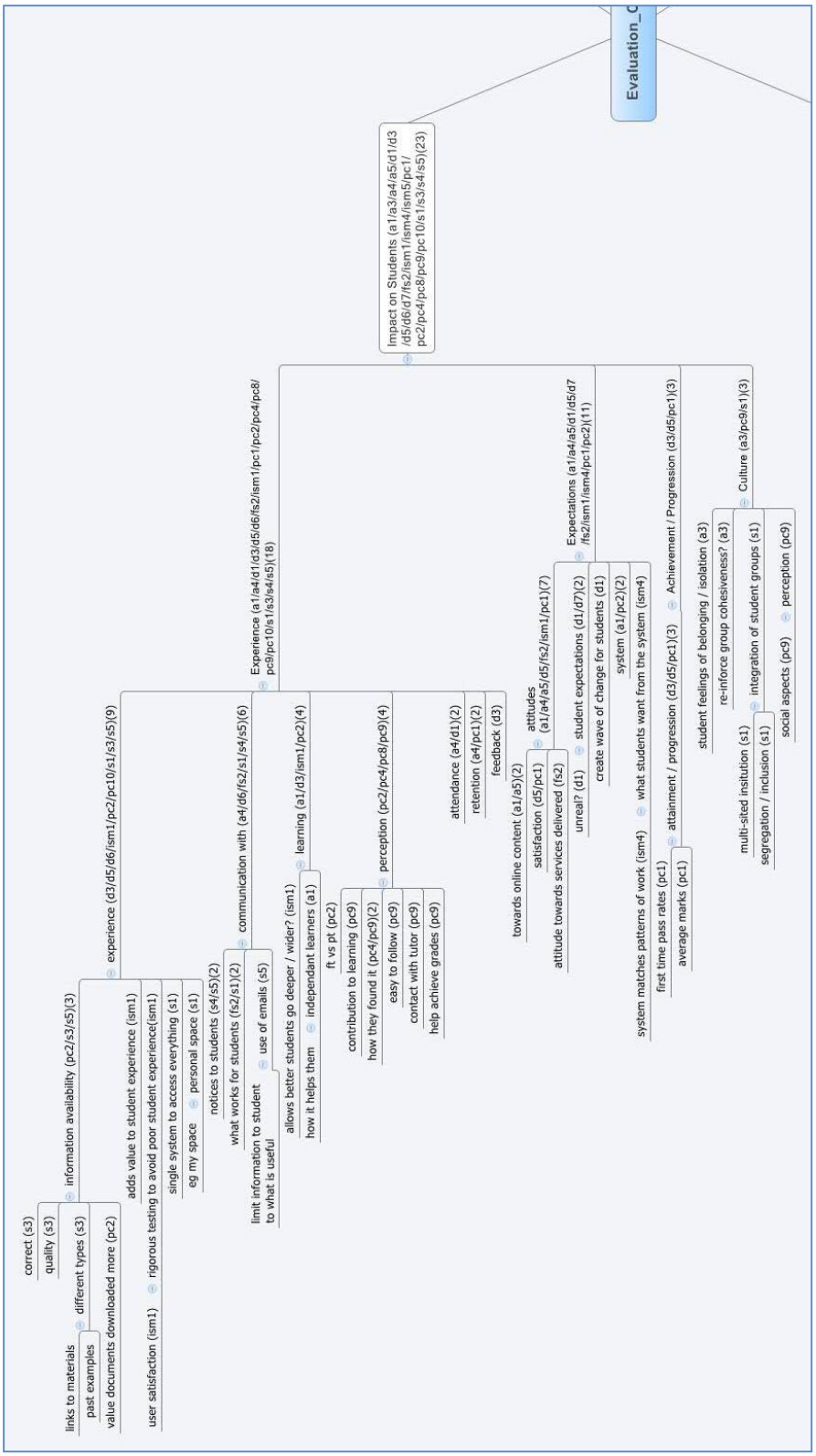
Iteration 1 - Student Group Map



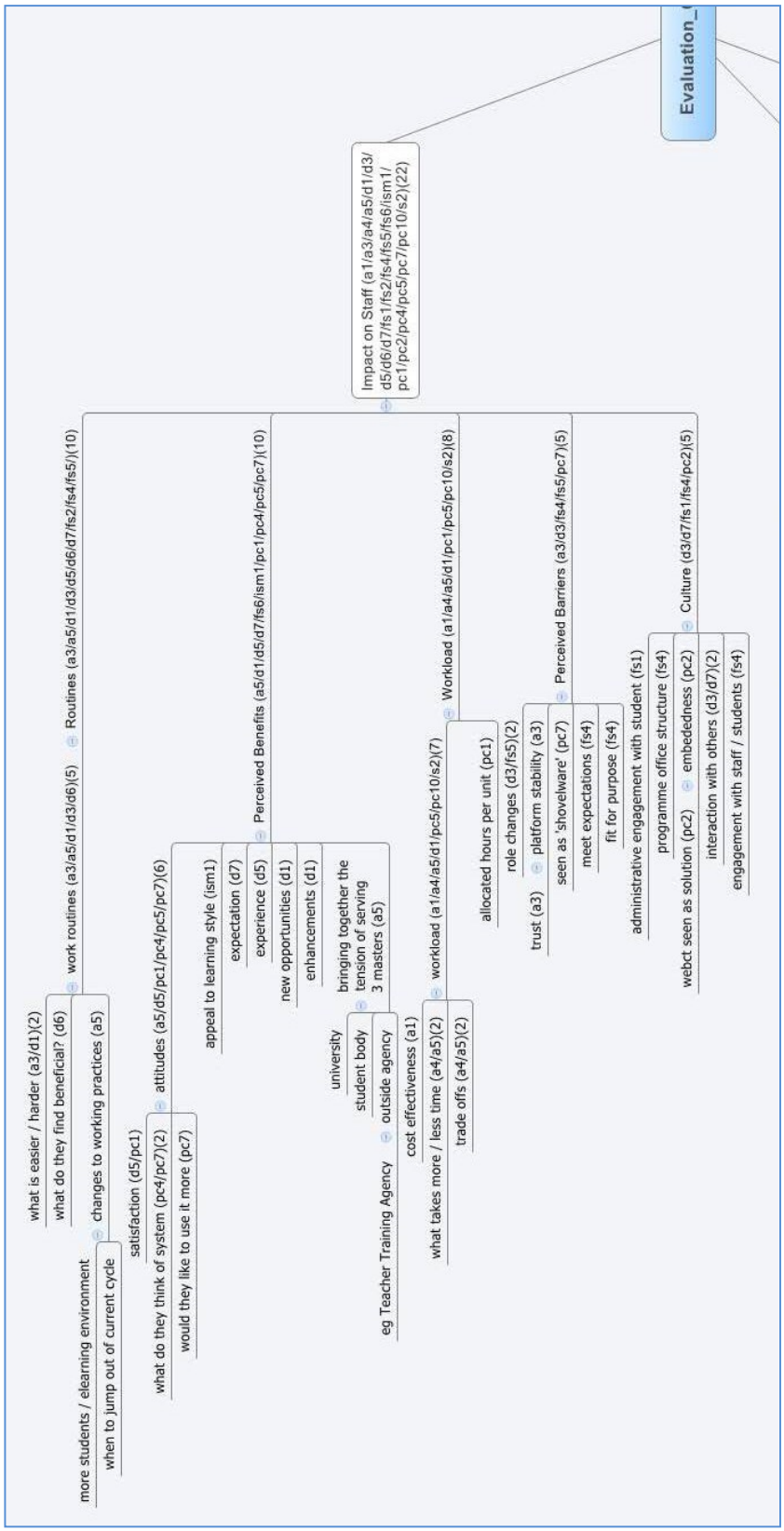
Iteration 1 - All Organisation Level Categories Collapsed



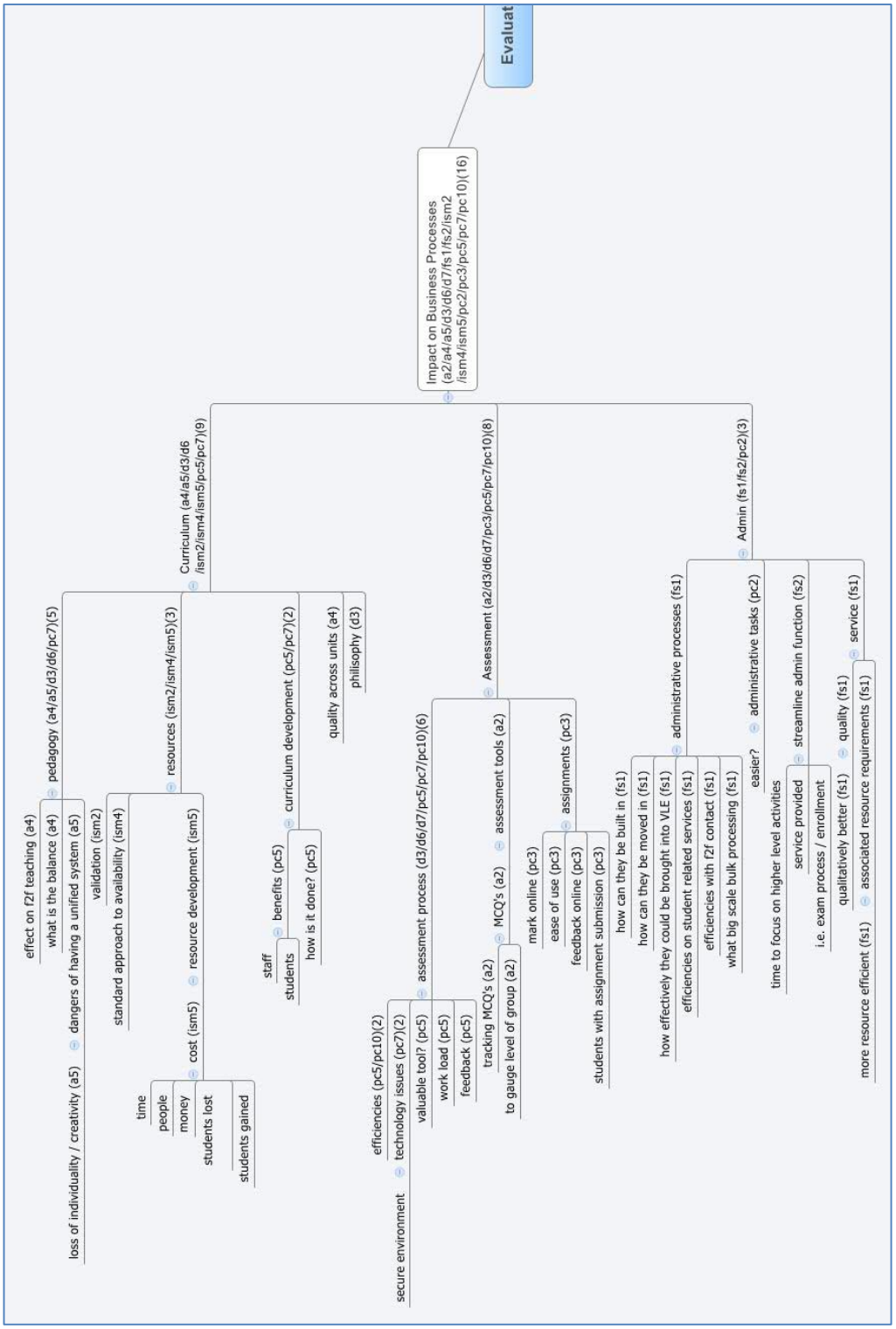
Iteration 1 - Impact on Student Category Expanded



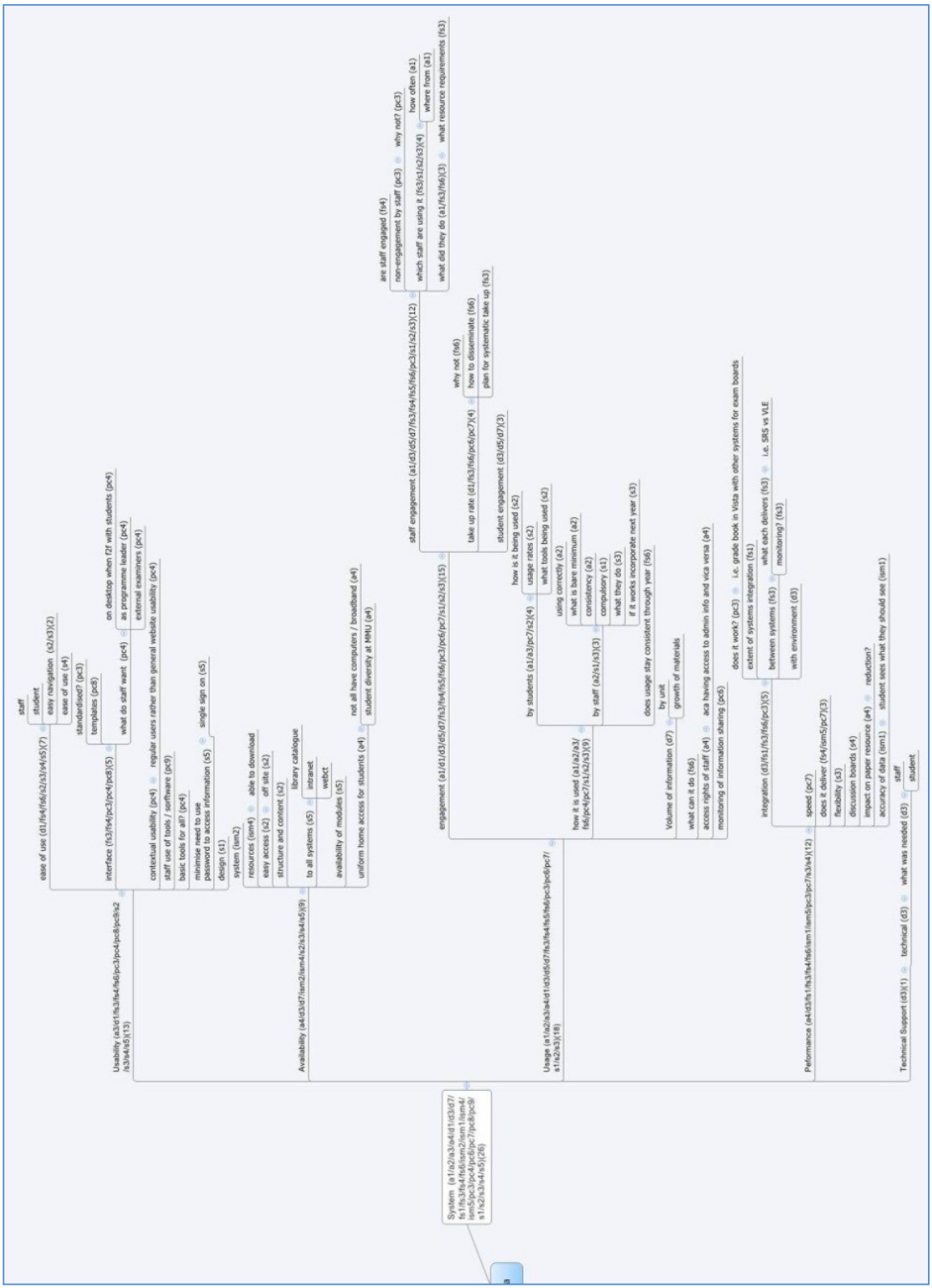
Iteration 1 - Impact on Staff Category Expanded



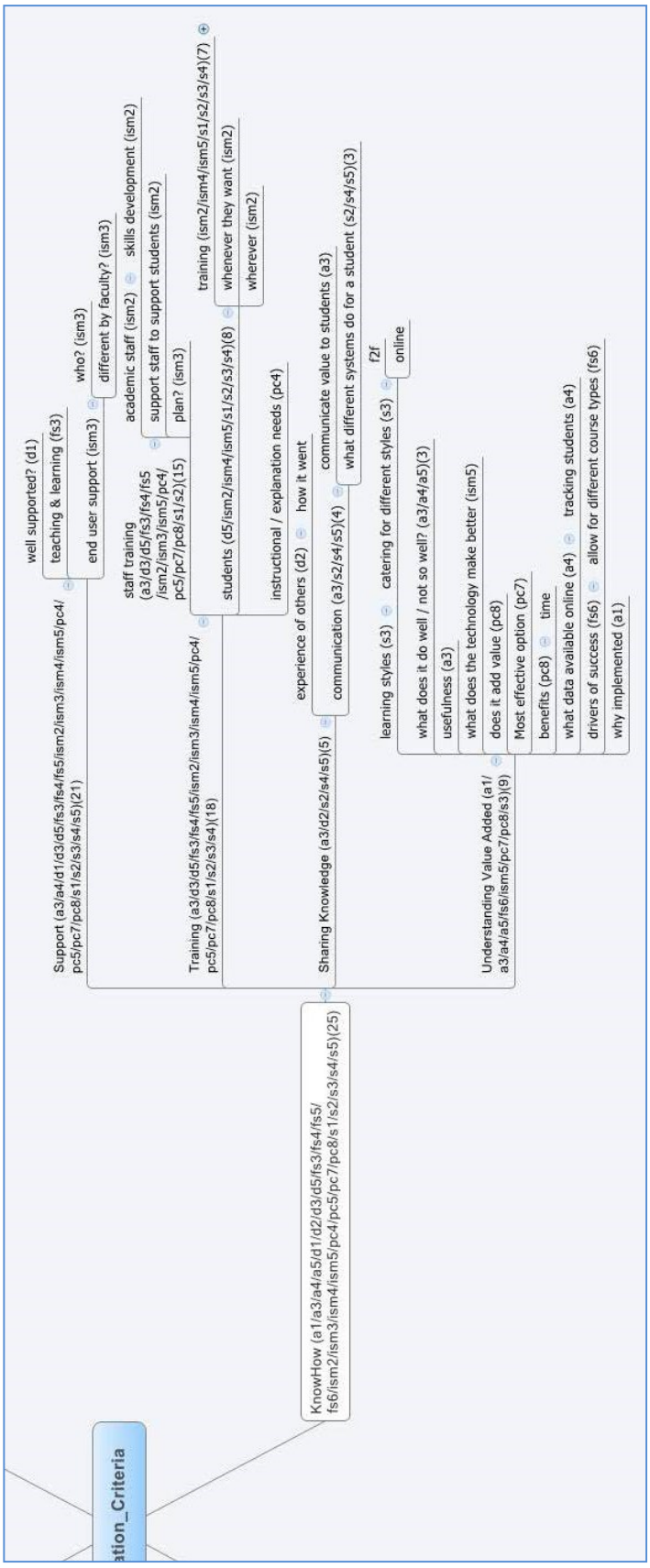
Iteration 1 - Impact on Business Processes Category Expanded



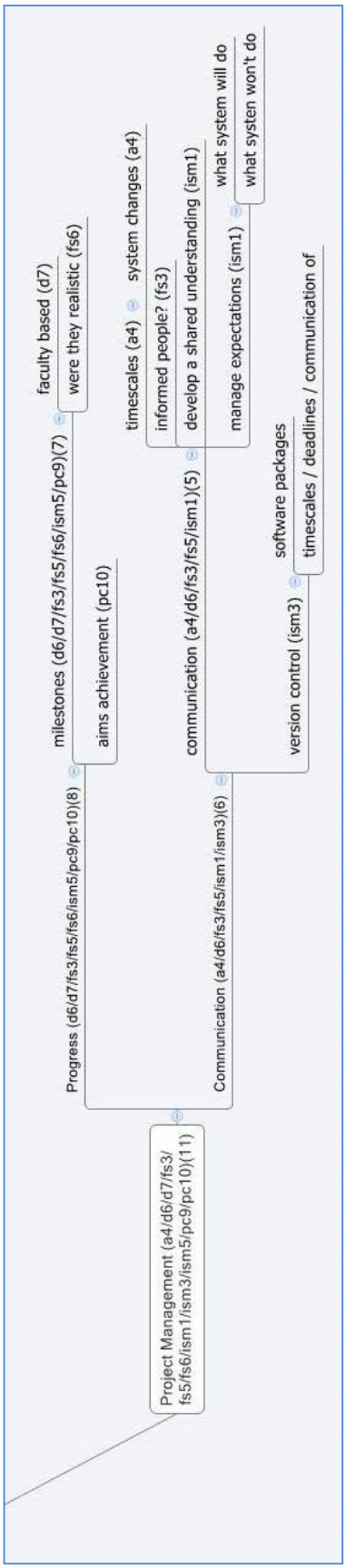
Iteration 1 - System Category Expanded



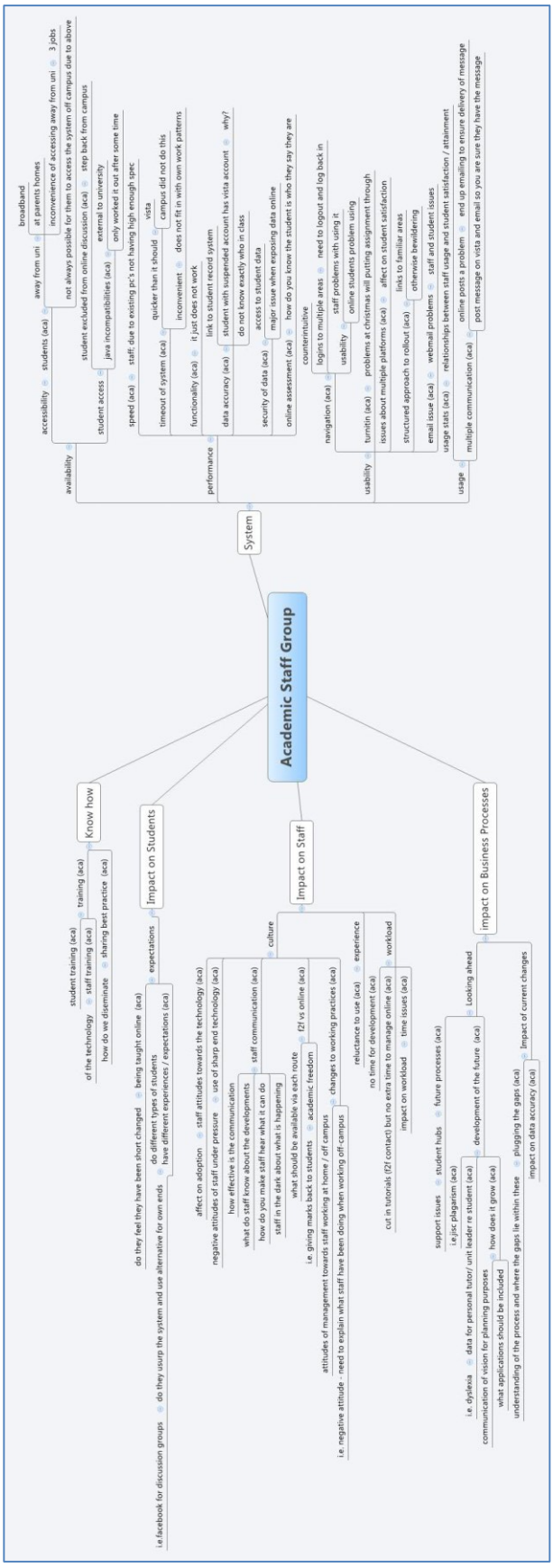
Iteration 1 - Know How Category Expanded



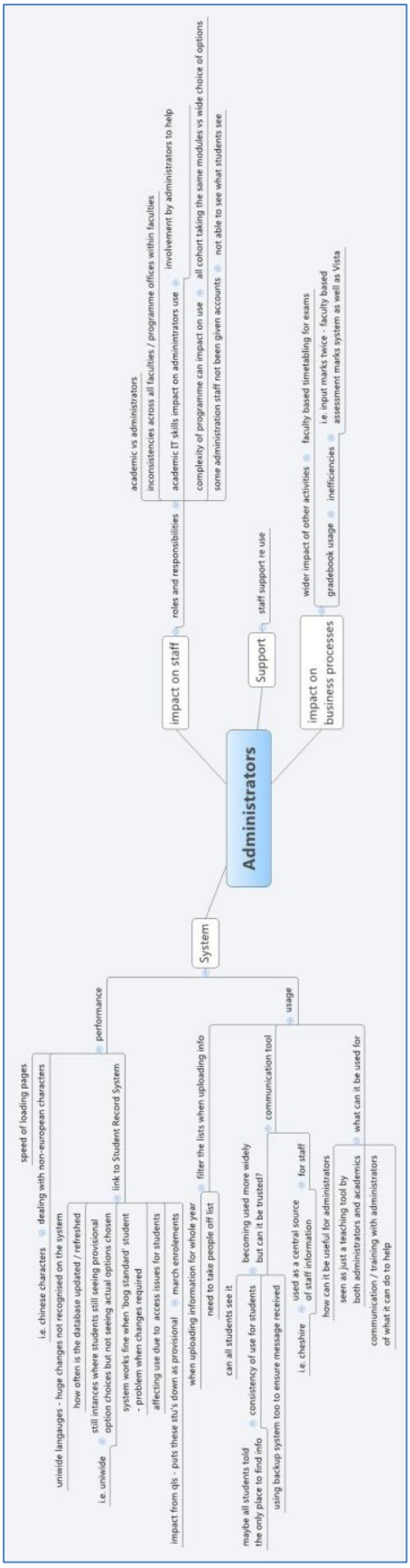
Iteration 1 - Project Management Category Expanded



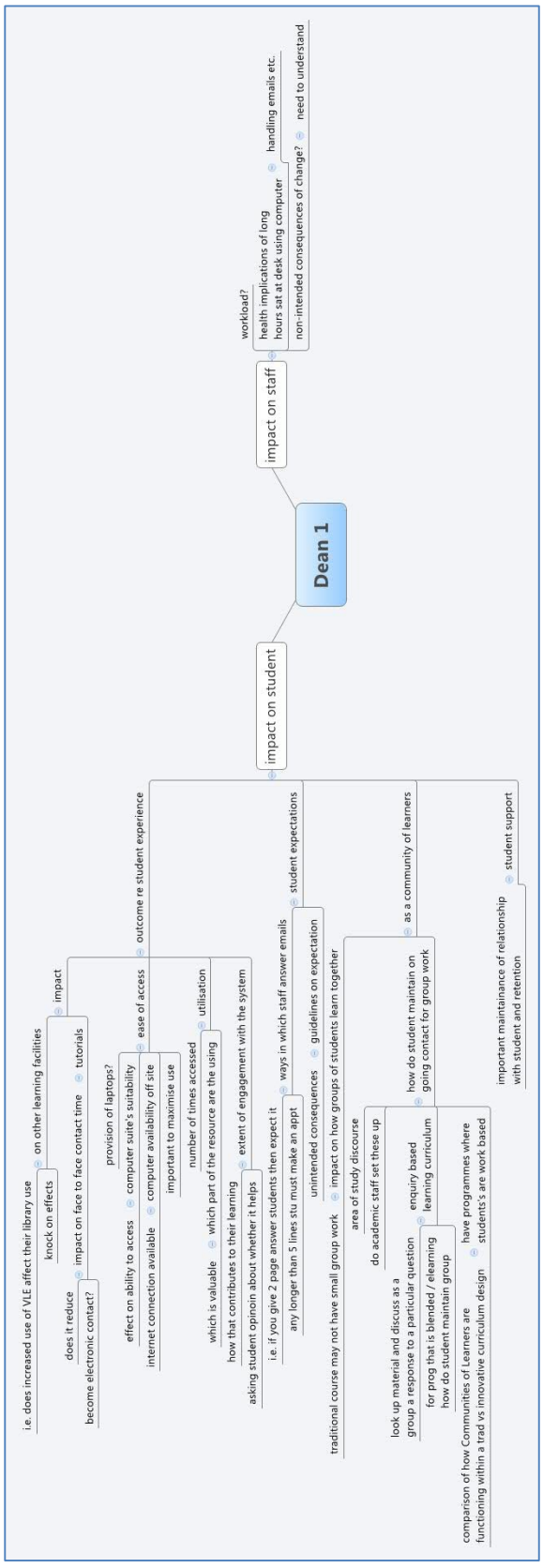
Iteration 2 - Academic Staff Group



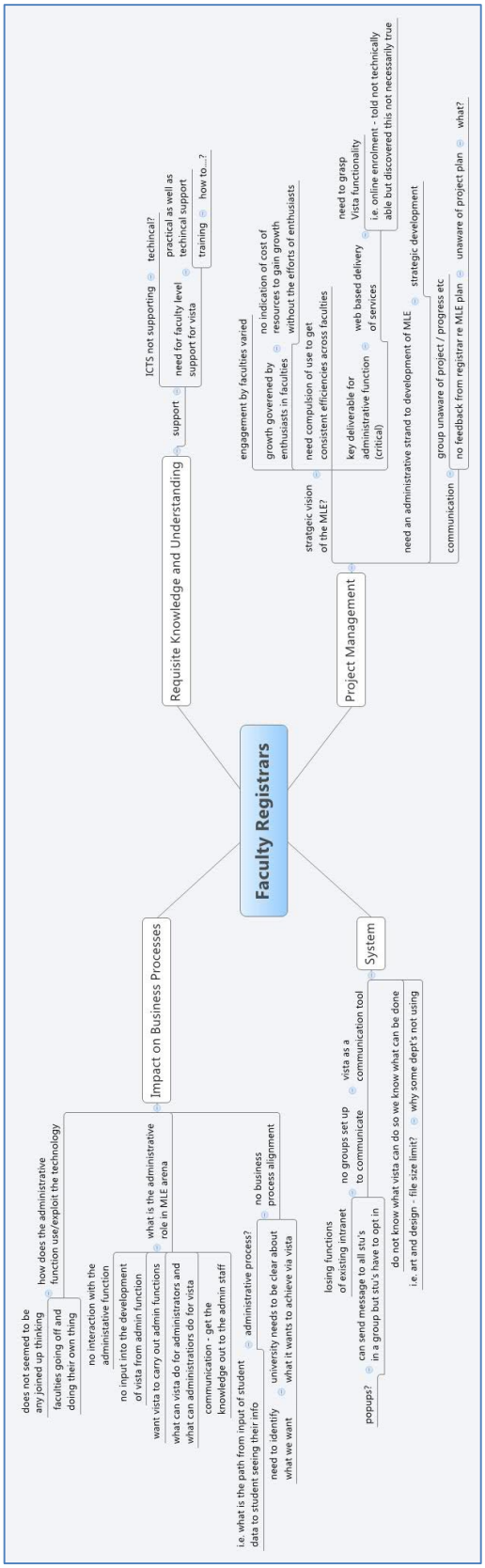
Iteration 2 - Administrator Group Map



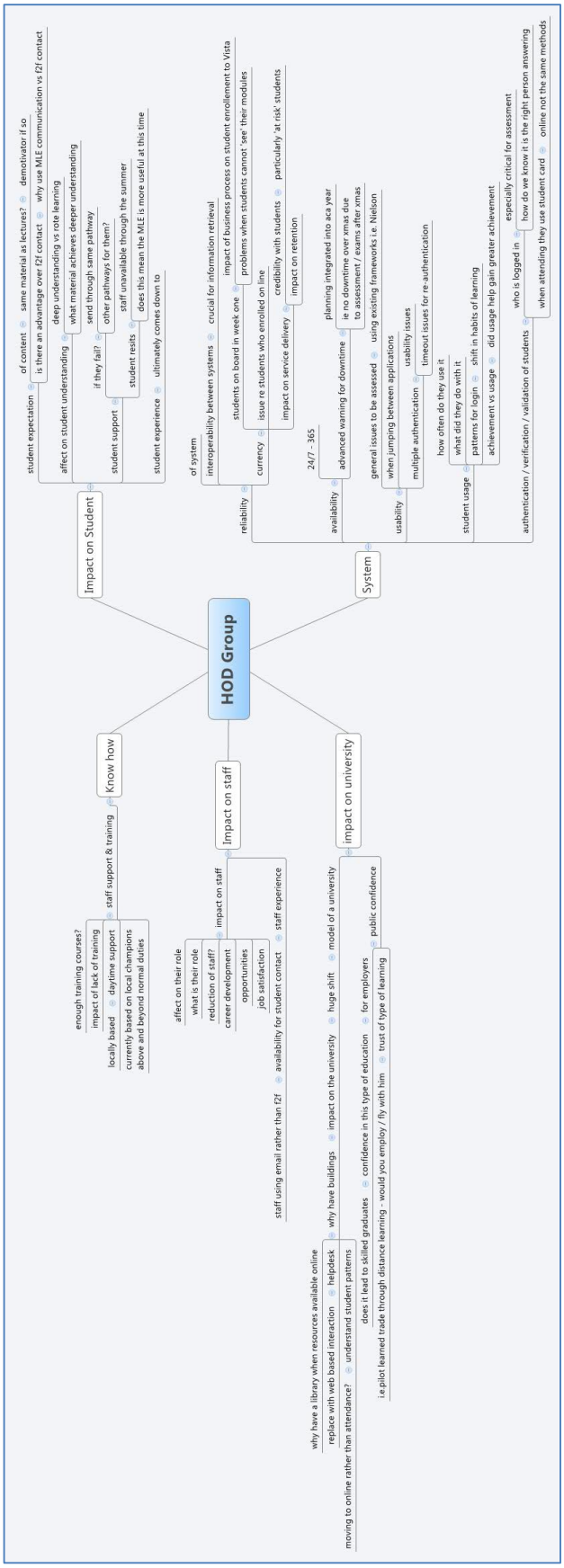
Iteration 2 - Dean Group Map



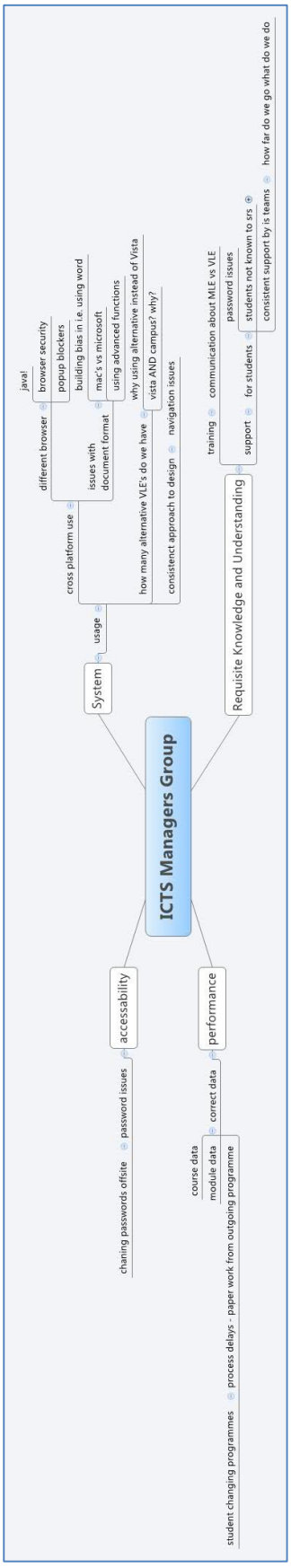
Iteration 2 - Faculty Registrar Group Map



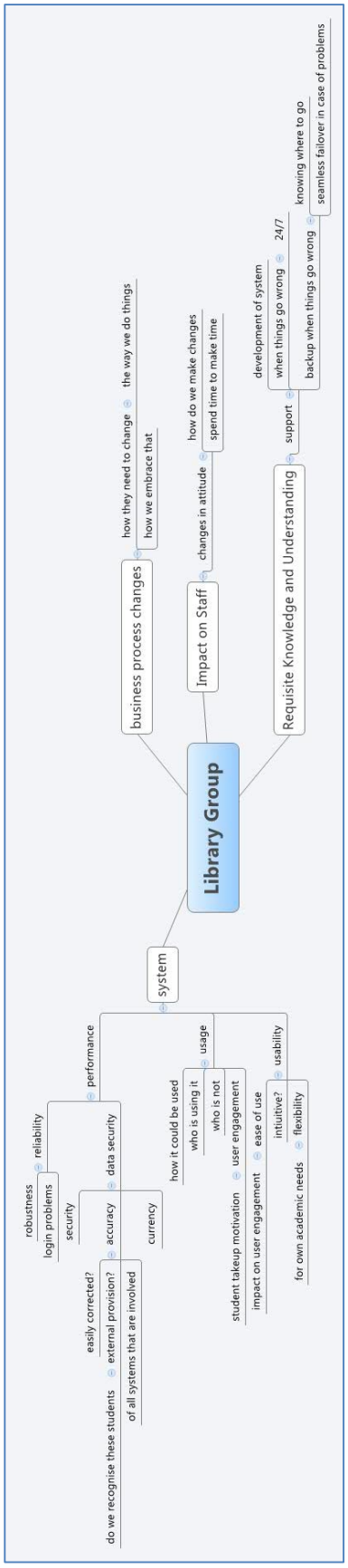
Iteration 2 - Head of Department Group Map



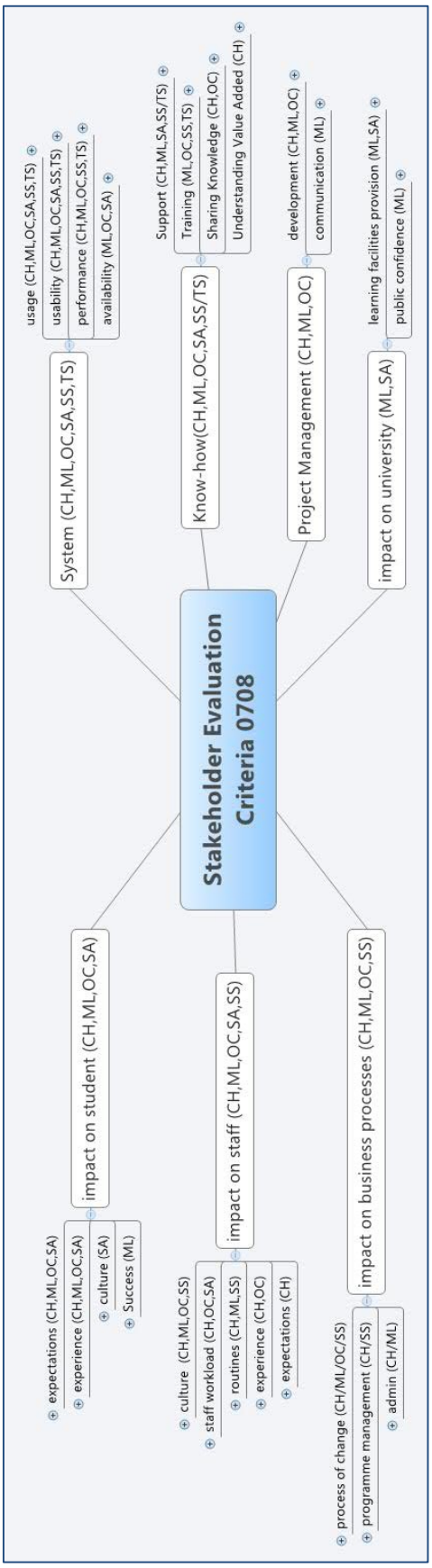
Iteration 2 - ICTS Managers Group Map



Iteration 2 - Library Managers Group Map



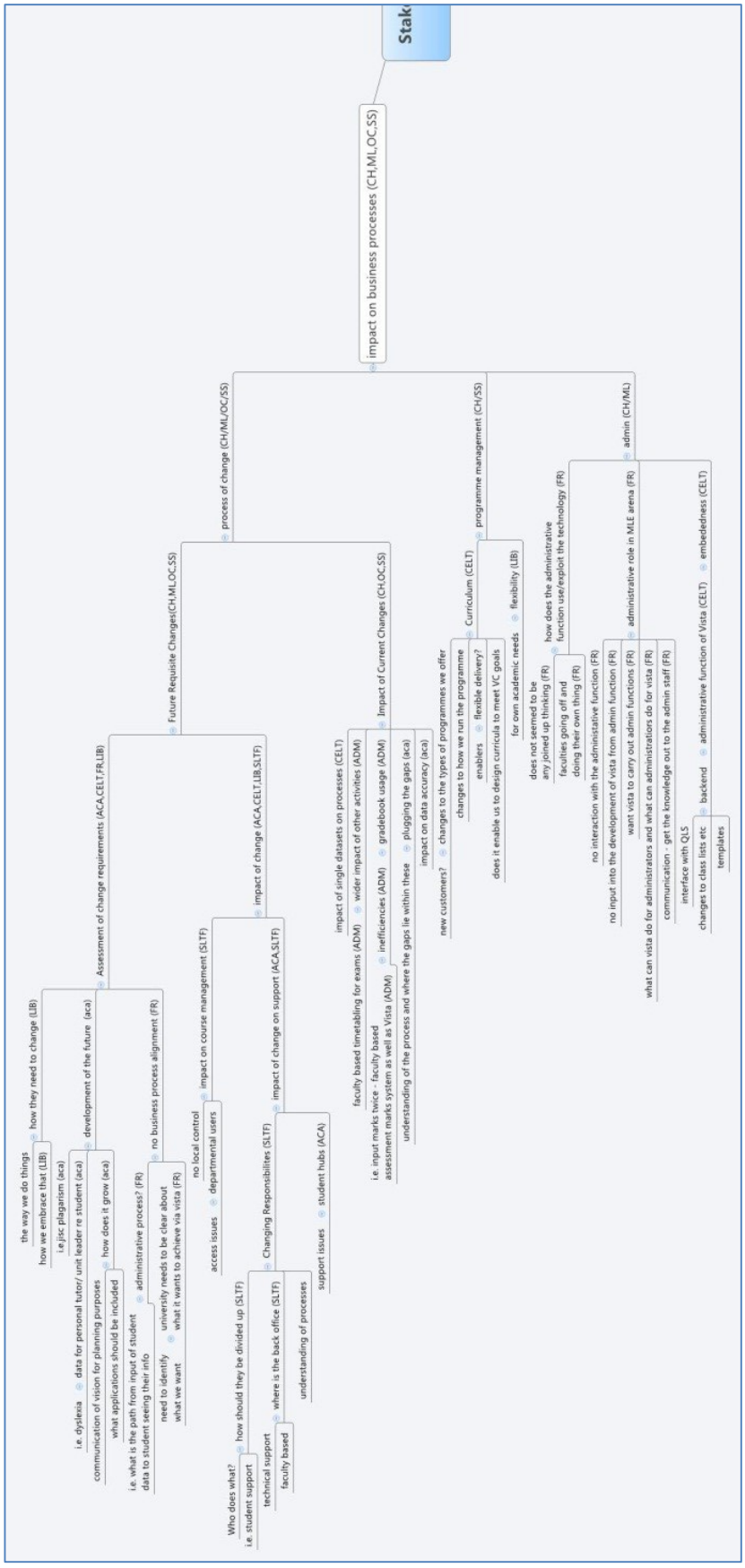
Iteration 2 - All Organisation Level Categories Collapsed



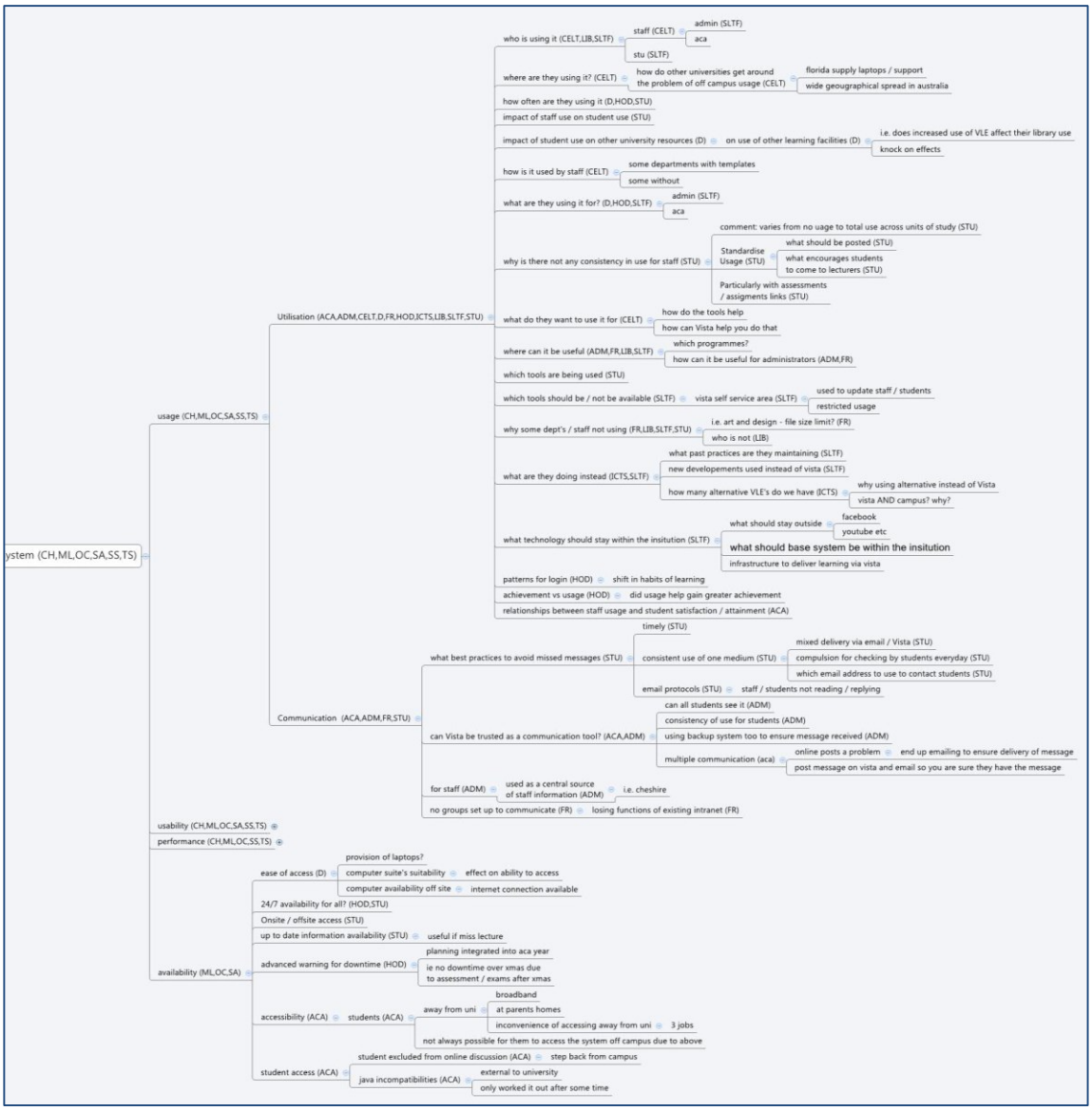
Iteration 2 - Impact on Students Category Expanded

Iteration 2 - Impact on Staff Category Expanded

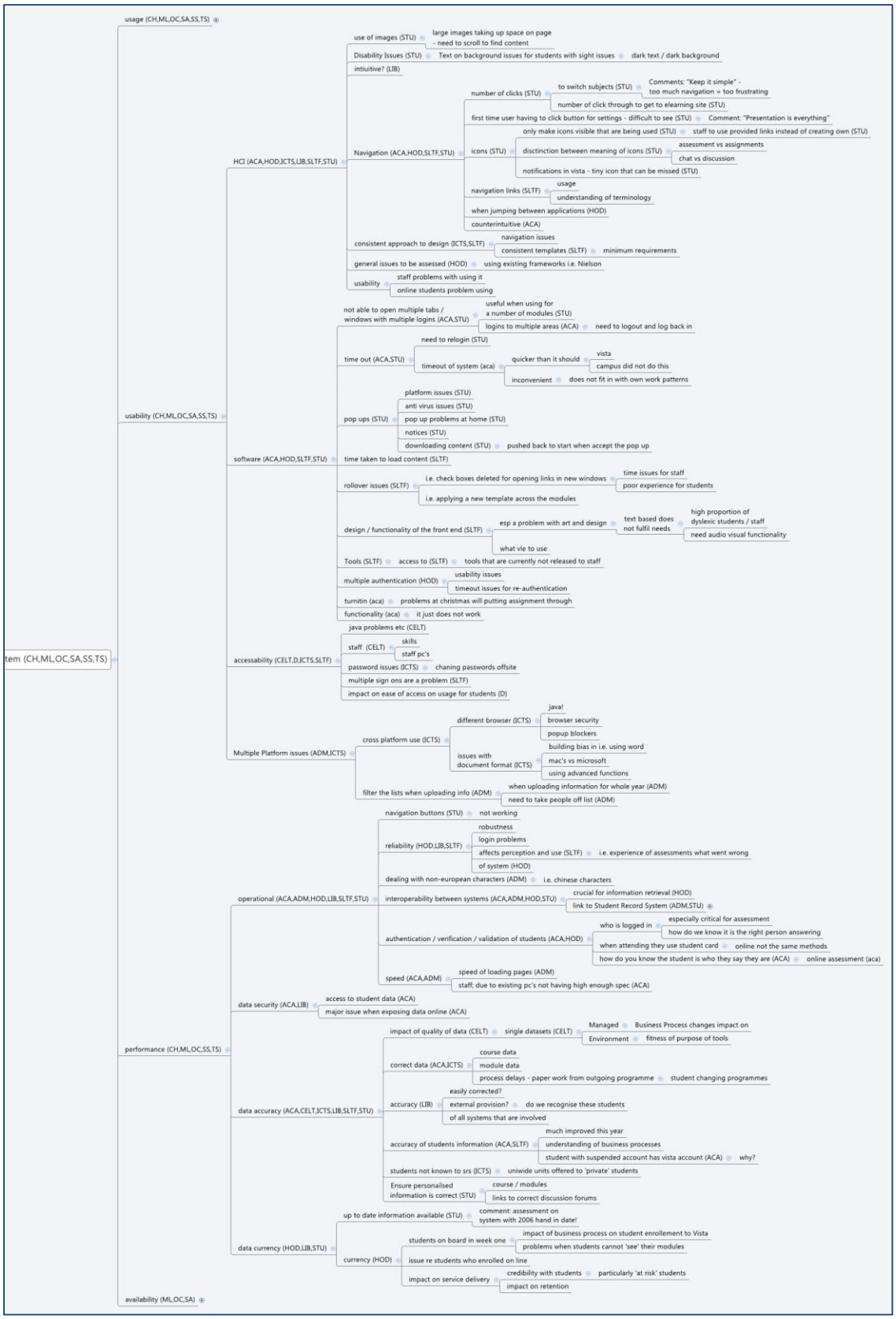
Iteration 2 - Impact on Business Processes Category Expanded



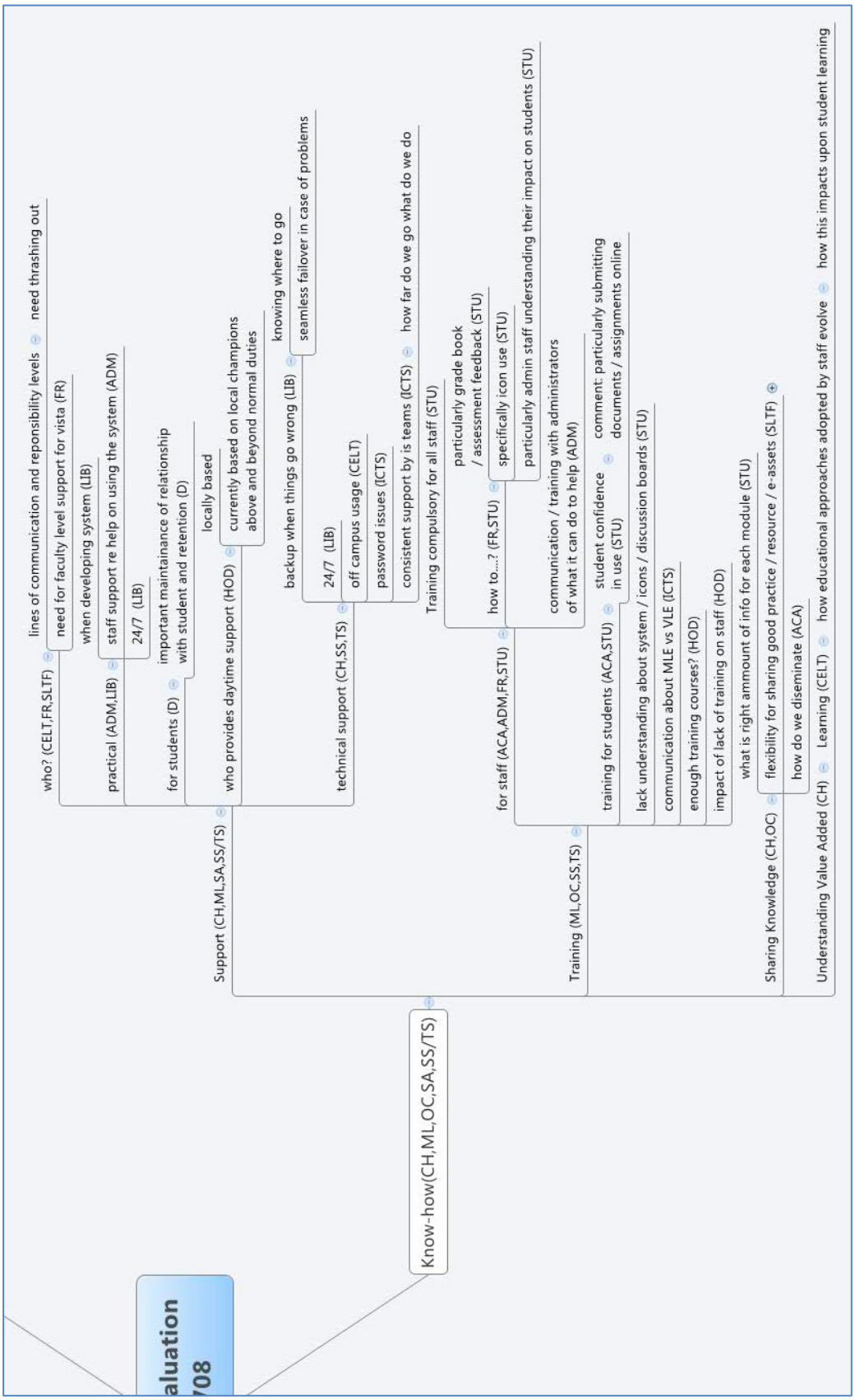
Iteration 2 - System (part 1) Category Expanded



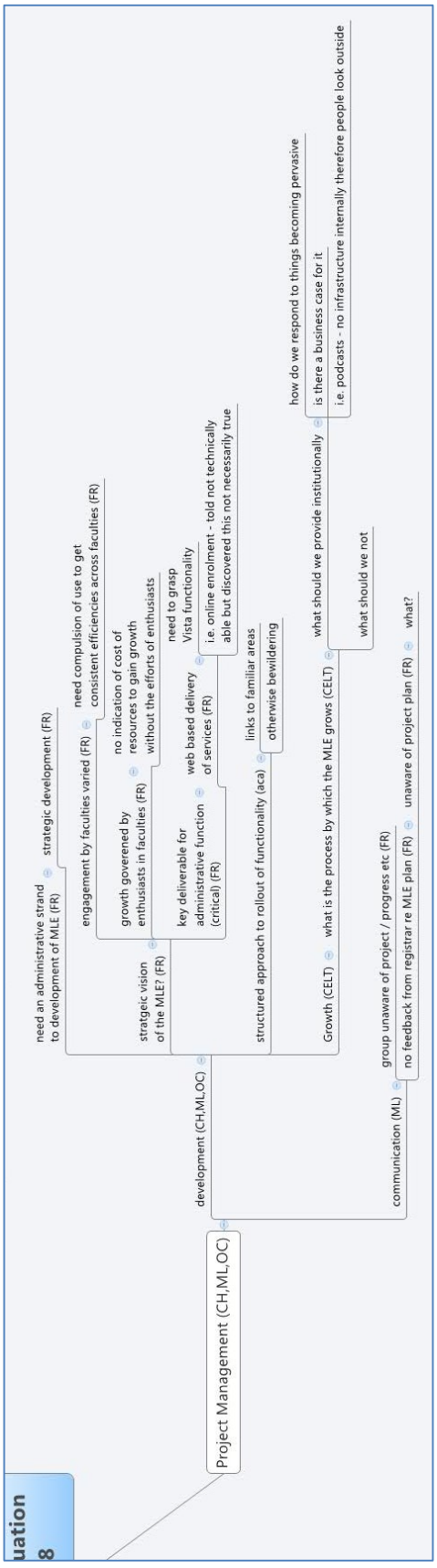
Iteration 2 - System (part 2) Category Expanded



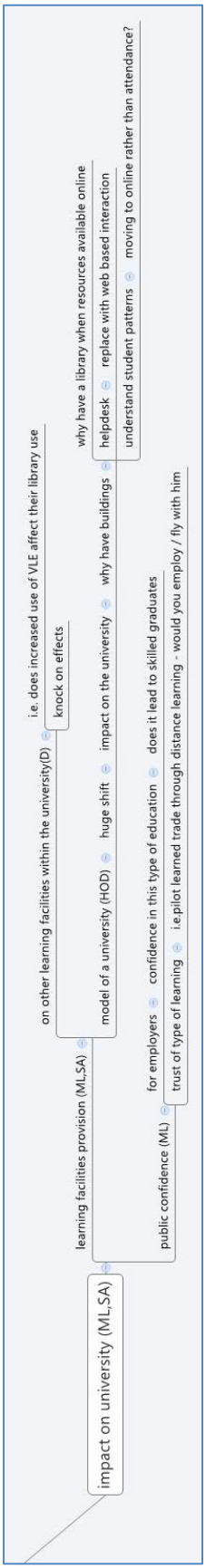
Iteration 2 - Know-how Category Expanded



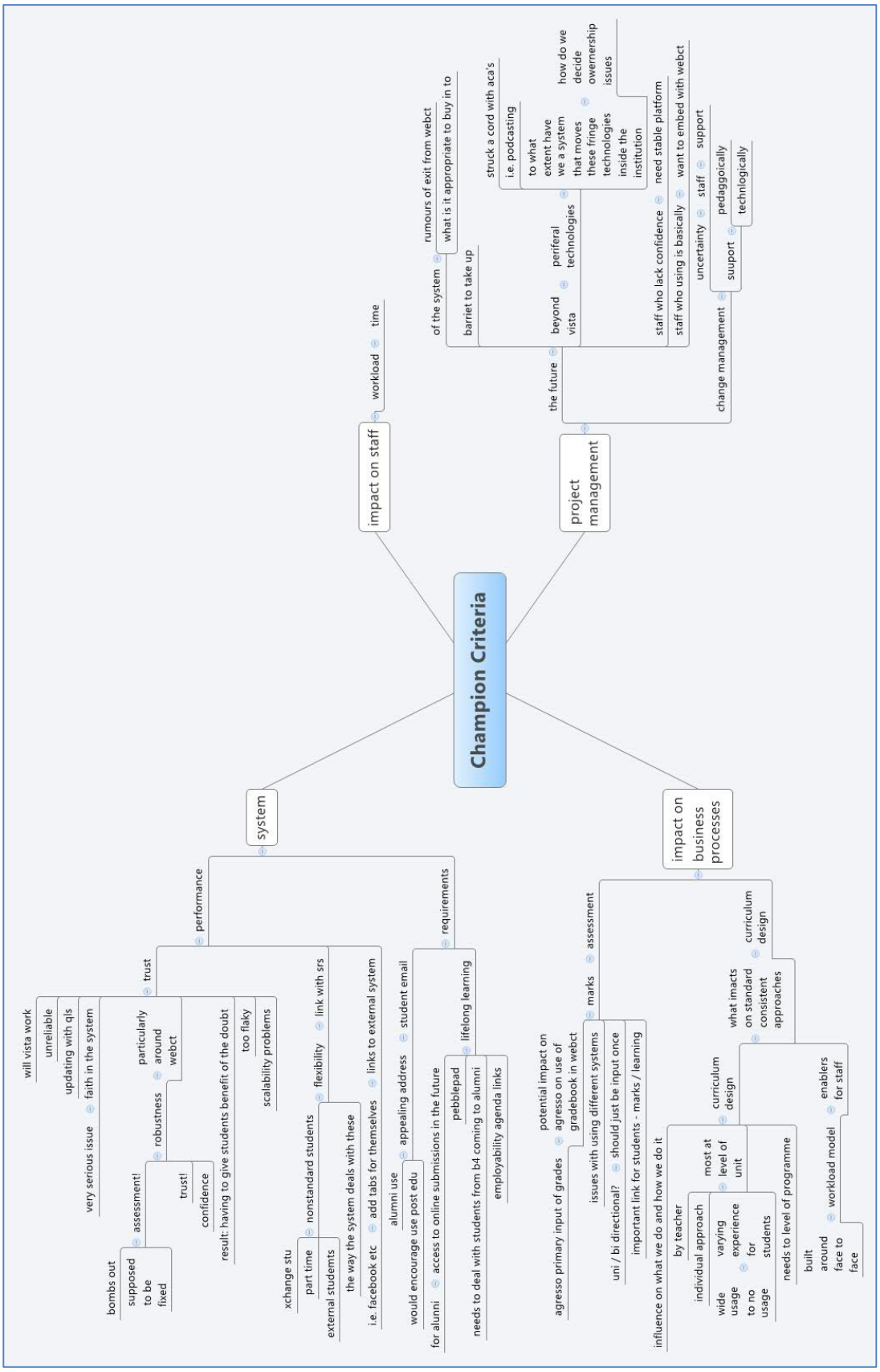
Iteration 2 - Project Management Category Expanded



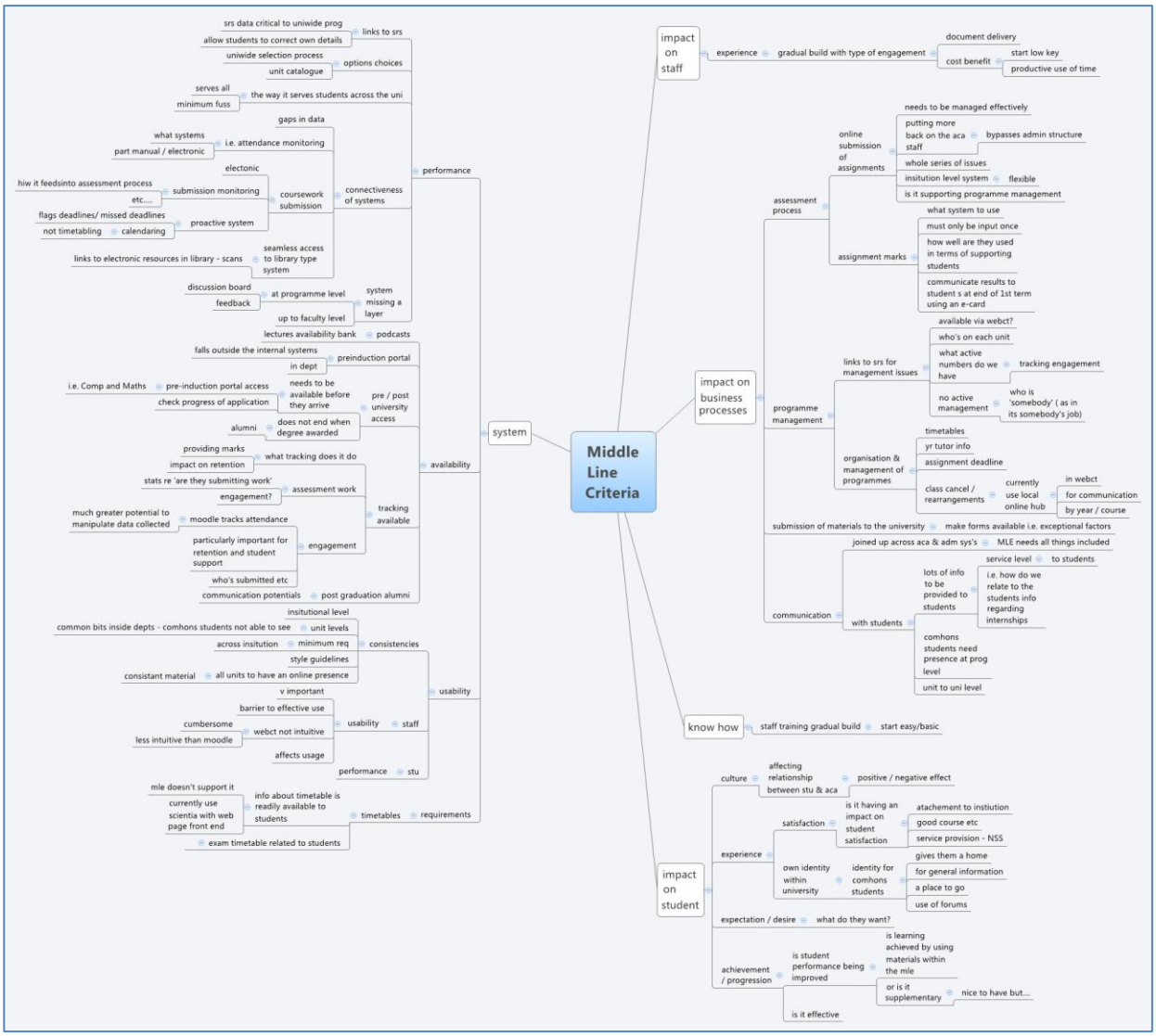
Iteration 2 - Impact on the University Category Expanded



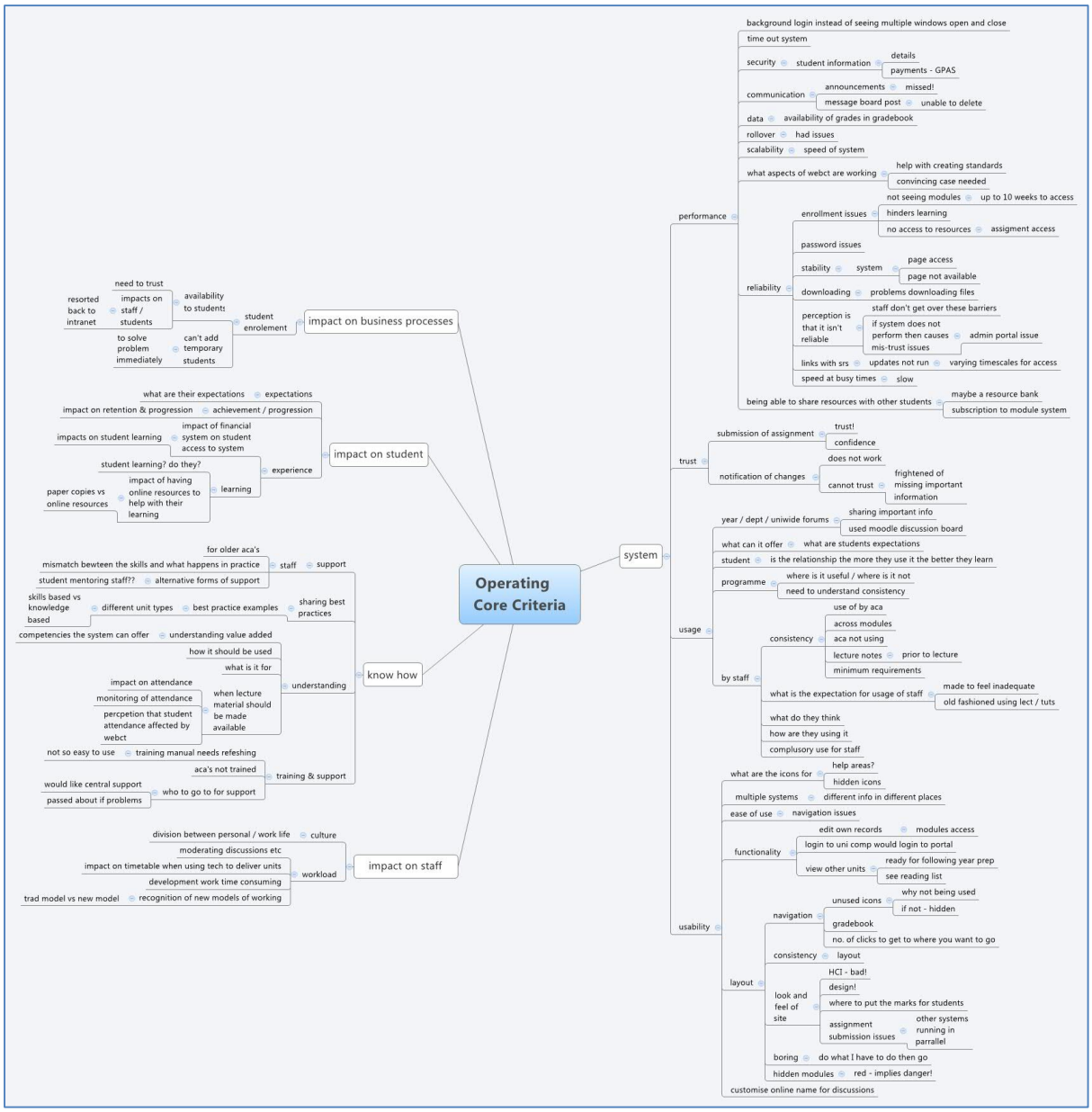
Iteration 3 - Champion Group Map



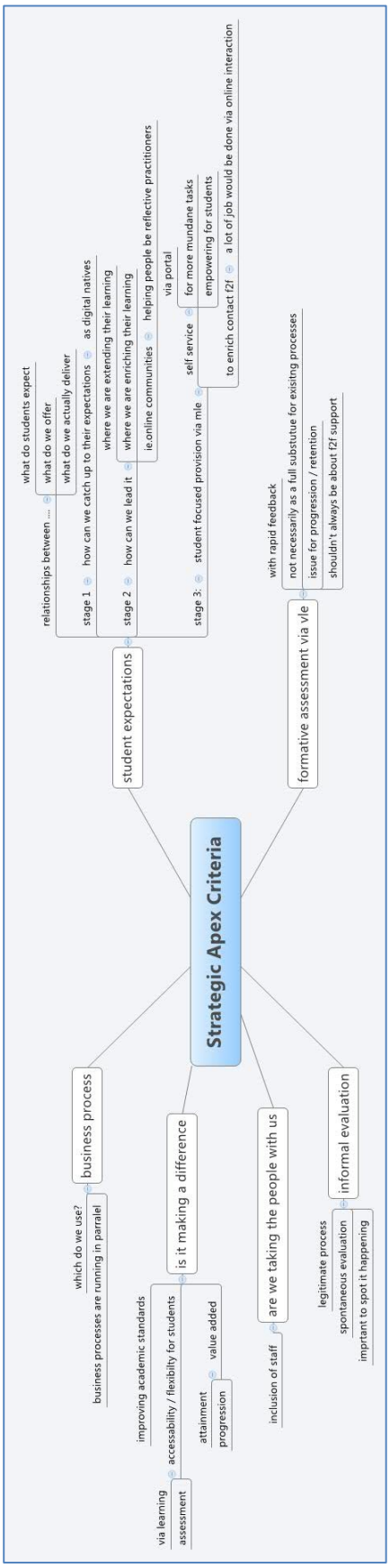
Iteration 3 - Middle Line Group Map



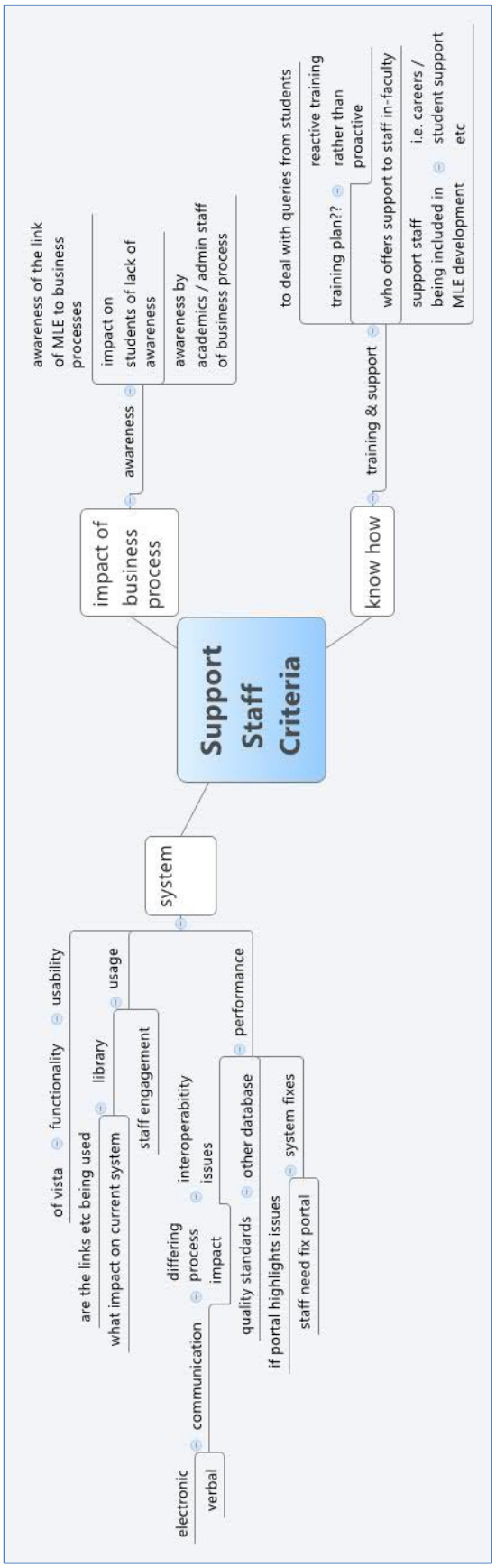
Iteration 3 - Operating Core Map



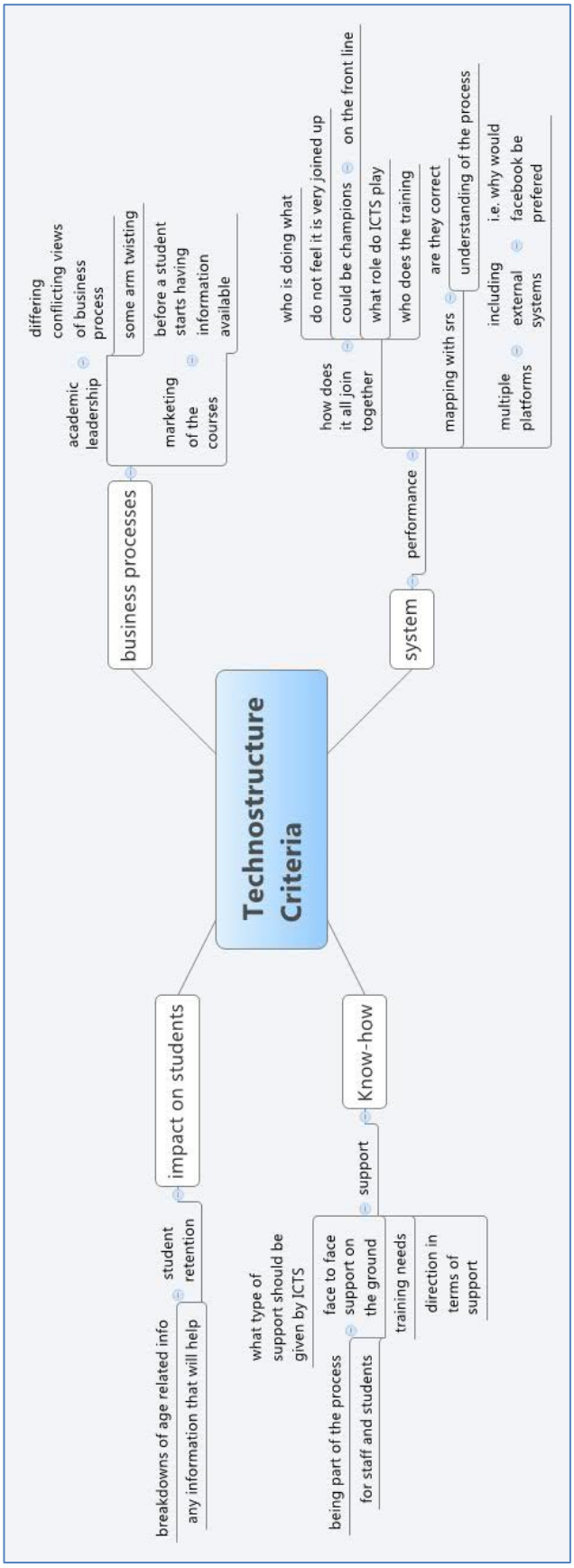
Iteration 3 - Strategic Apex Group Map



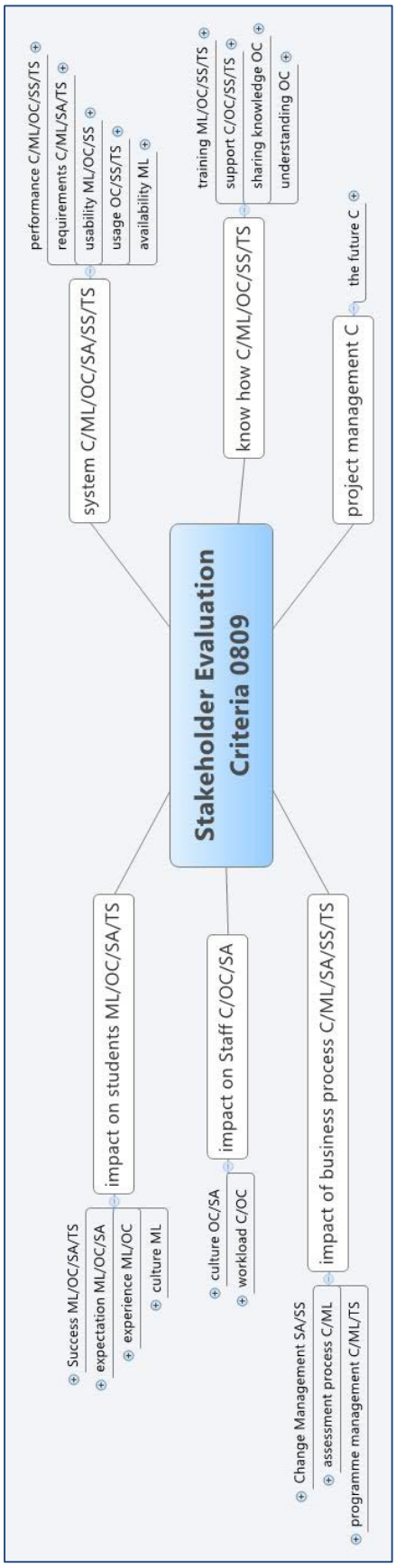
Iteration 3 - Support Staff Group Map



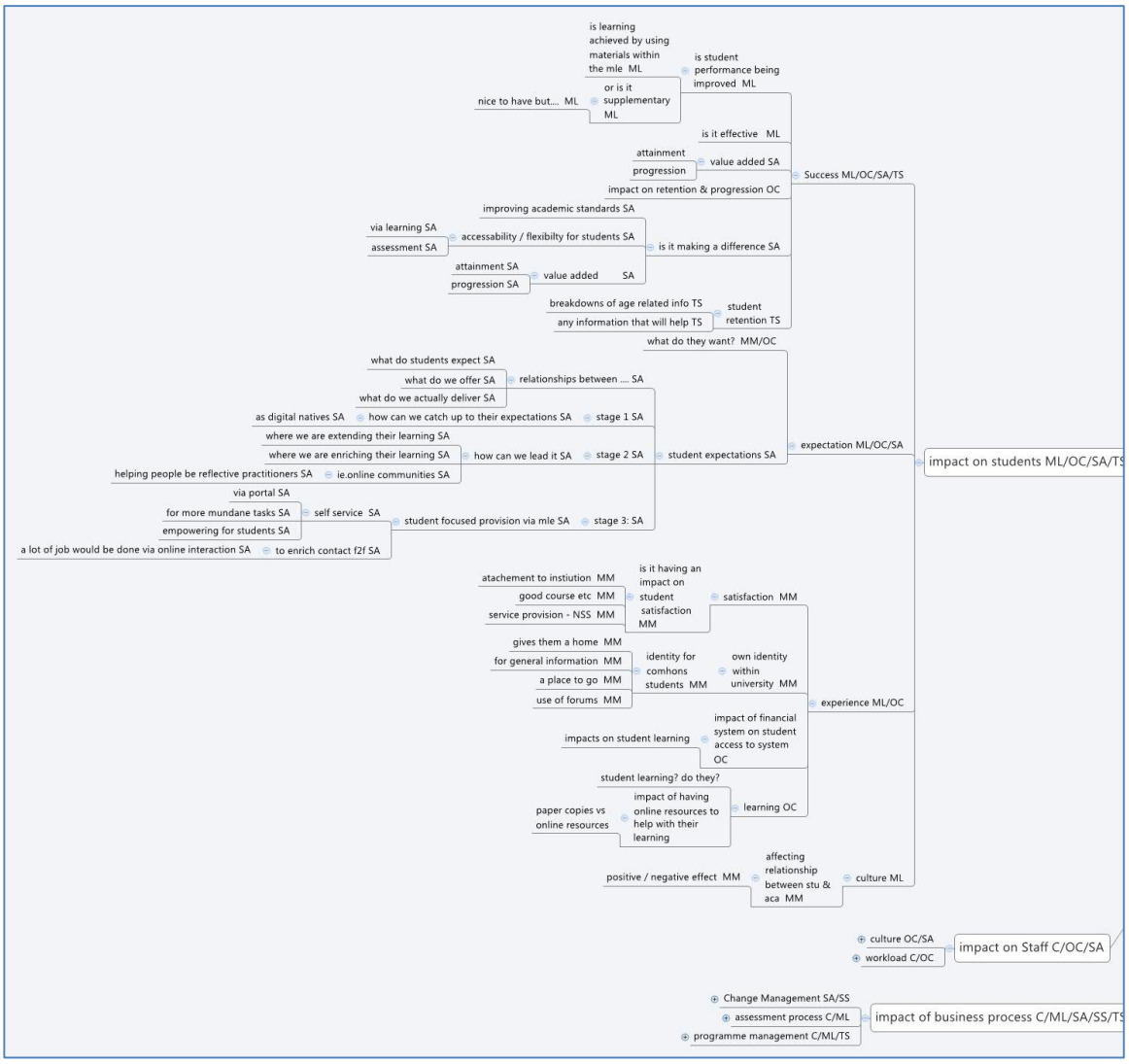
Iteration 3 - Technostructure Group Map



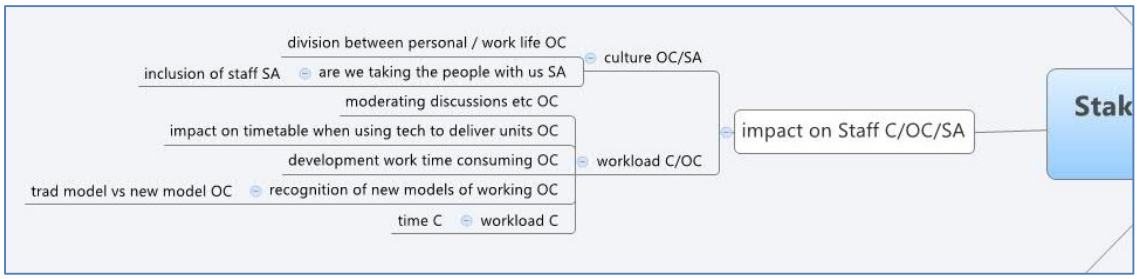
Iteration 3 - All Organisation Level Categories Collapsed



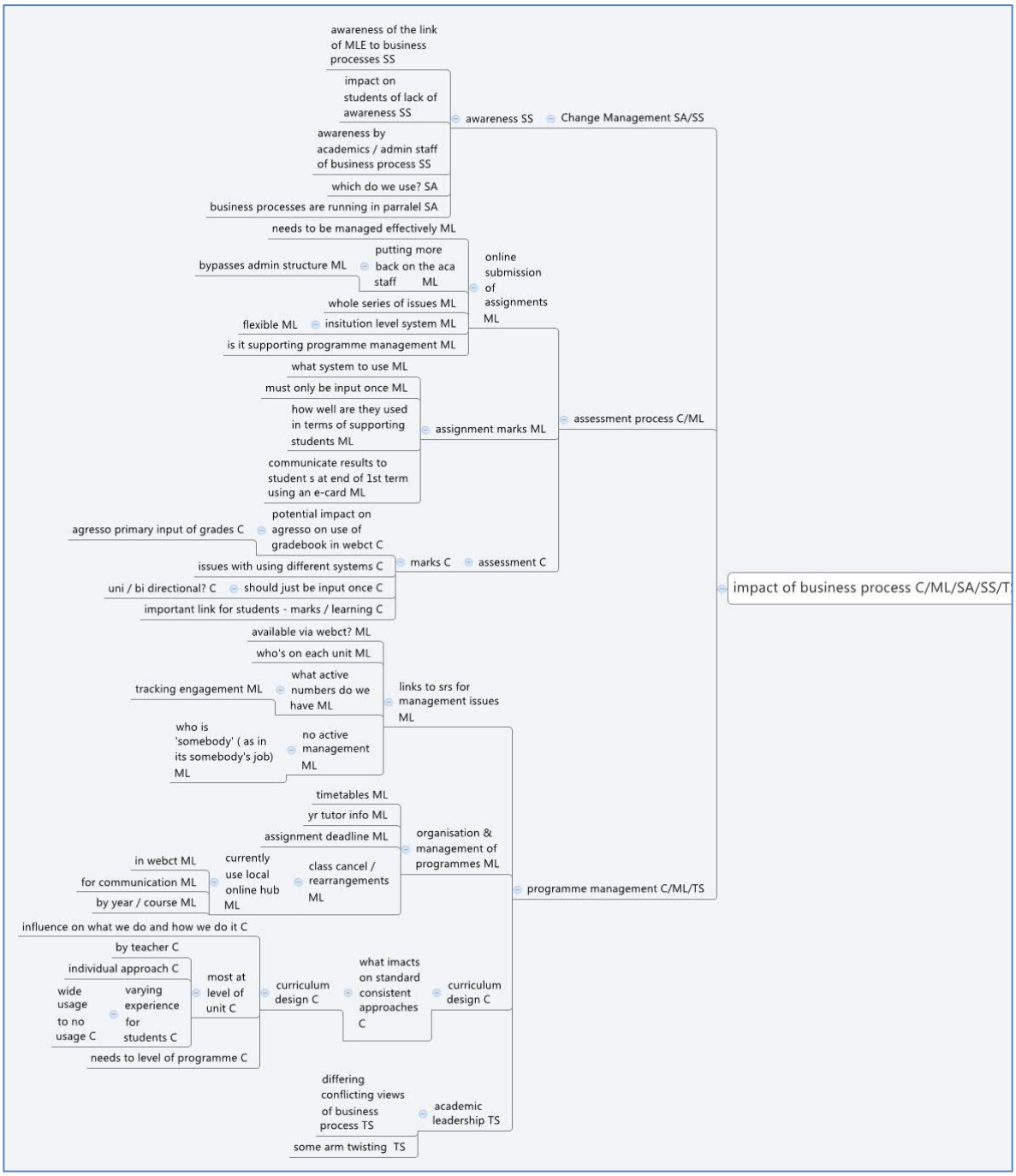
Iteration 3 - Impact on Students Category Expanded



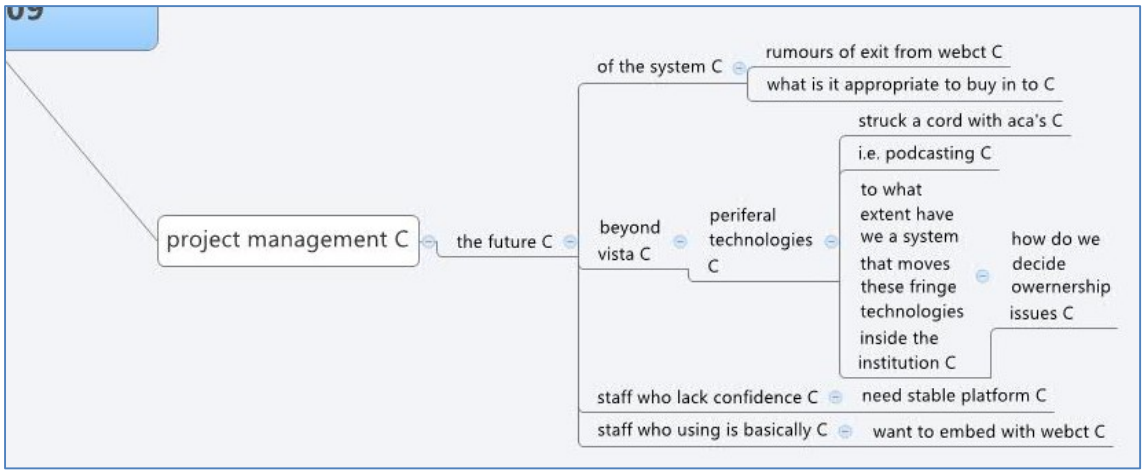
Iteration 3 - Impact on Staff Category Expanded



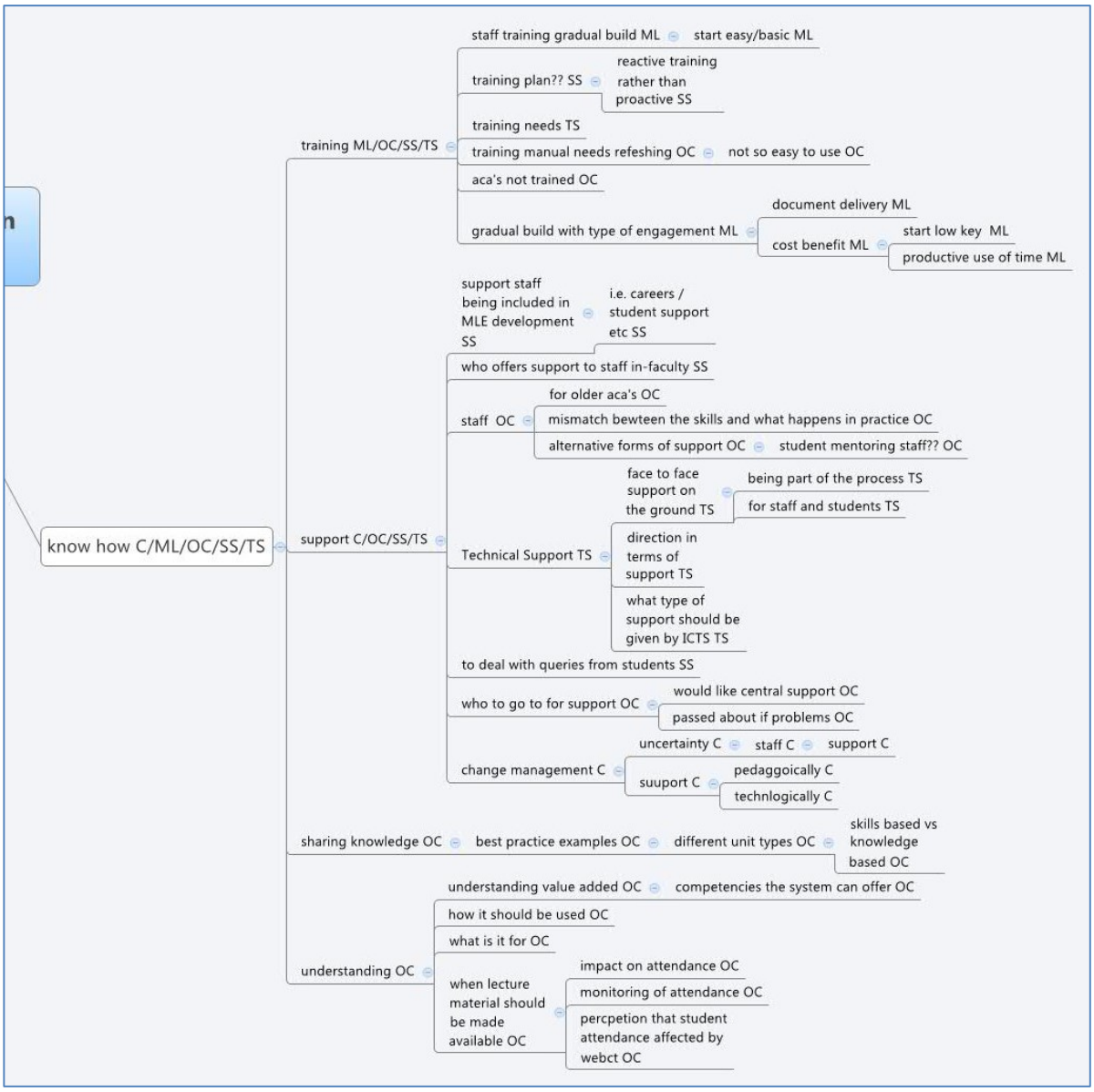
Iteration 3 - Impact on Business Processes Category Expanded



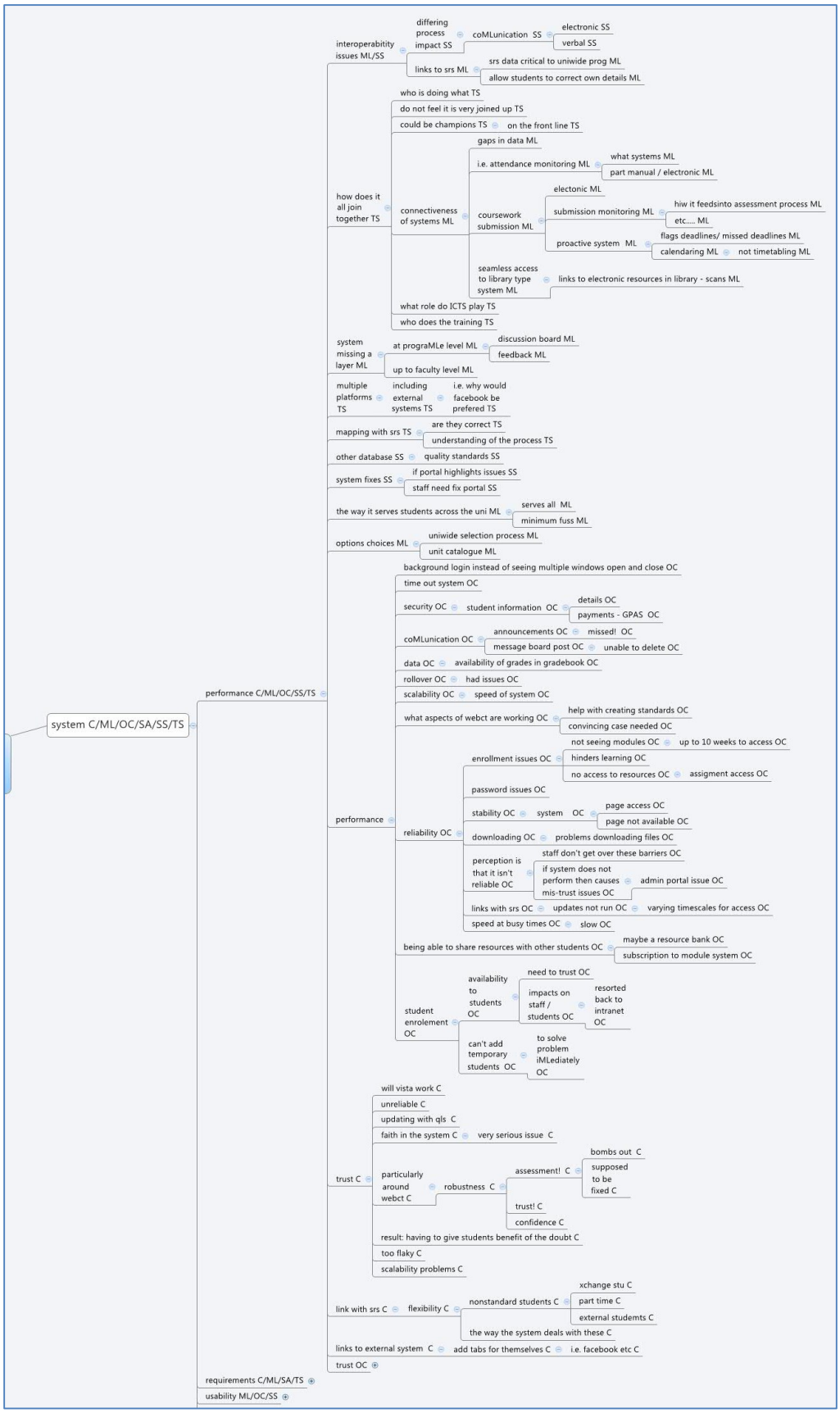
Iteration 3 - Project Management Category Expanded



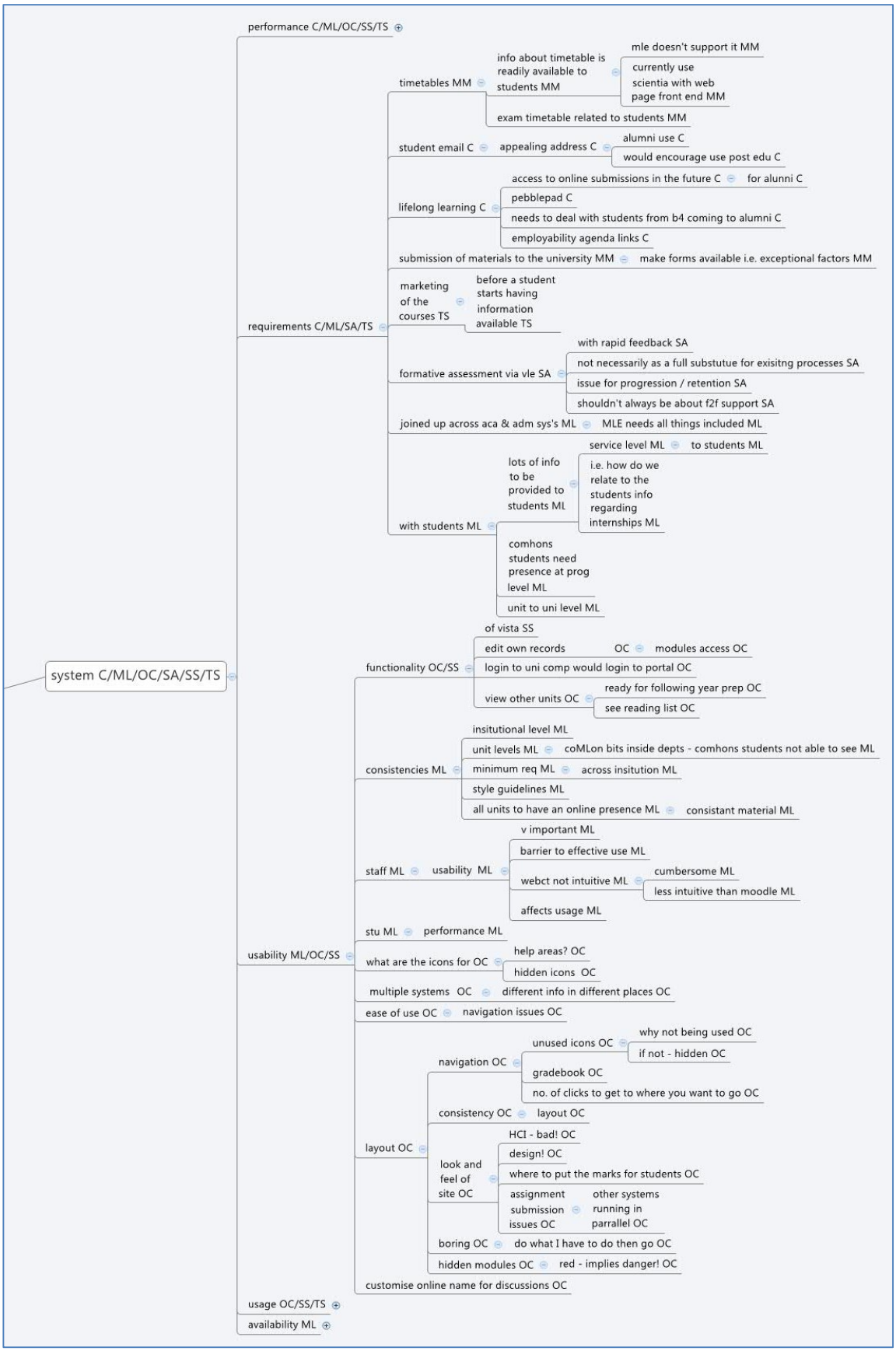
Iteration 3 - Know How Category Expanded



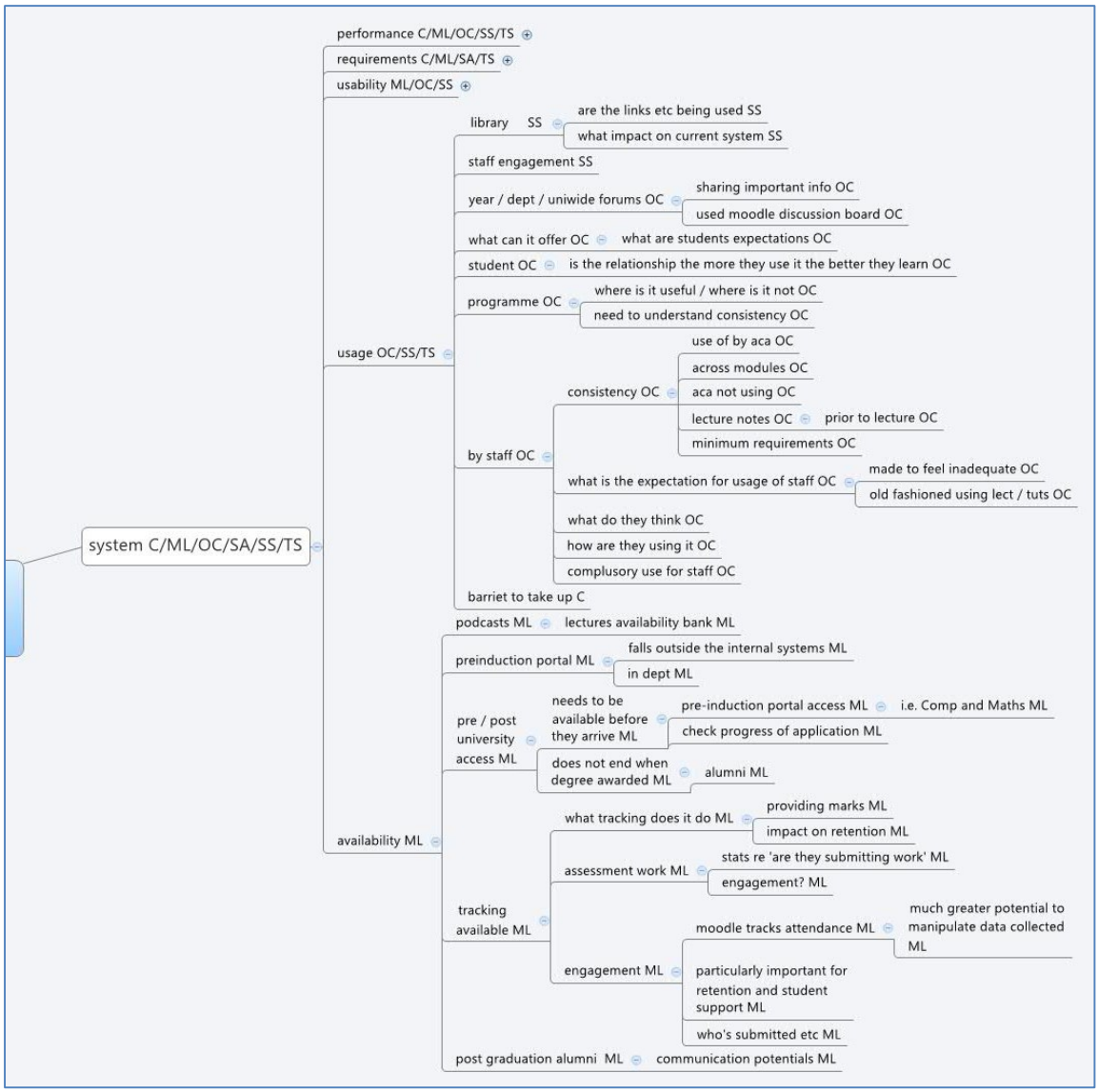
Iteration 3 - System (part 1) Category Expanded



Iteration 3 - System (part 2) Category Expanded



Iteration 3 - System (part 3) Category Expanded



APPENDIX B - COMPARISON MAPPINGS FROM STEP 3

The following pages contain the comparison between the MLE Project <Model and the stakeholder criteria generated in step 2.

Iteration 1 - Comparison of MLE Project Model and Stakeholder Criteria

	Ranked Stakeholder Criteria	Support (RKU)	Training (RKU)	Usage (SYS)	Experience (STU)	Usability (SYS)	Performance (SYS)	Expectations (STU)	Routines (STA)	Perceived Benefits (STA)	Availability (SYS)	Understanding Value Added (RKU)	Curriculum Development (IBP)	Workload (STA)	Assessment (IBP)	Progress (PM)	Communications (PM)	Culture(STA)	Sharing Knowledge (RKU)	Achievement / Progression (STU)	Culture (STU)	Admin (IBP)
MLE Project Model	d1	✓	--	✓	--	--	✓	--	--	--	--	--	--	--	--	--	--	✓	--	--	--	--
	h1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓	✓	--	--	--	--	--
	h2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓	--	--	--	--	--
	h3	--	--	--	--	--	✓	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	h4	--	--	--	--	--	✓	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	h5	✓	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	h6	--	--	--	--	--	✓	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	h7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓	--	--	--
	h8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	h9	--	✓	--	--	--	--	--	--	✓	--	✓	--	--	--	--	--	--	--	--	--	--
	h10	--	--	✓	✓	--	--	✓	--	--	--	--	--	--	--	--	--	--	--	✓	✓	--
	h11	--	--	--	--	--	--	--	--	--	--	--	✓	--	--	--	--	--	--	--	--	--
	h12	--	--	--	--	✓	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	h13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓	--	--	--	--	--	--
	w1	--	--	--	✓	--	--	--	--	--	✓	--	--	--	--	--	--	--	--	--	--	--
	w2	--	--	--	--	--	--	--	--	--	--	--	✓	--	--	--	--	--	--	--	--	--
	w3	✓	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Key: (from project model: d = do what | h = how | w = why)

d1. establish a robust, scalable, well-supported and well integrated e-learning Environment for all staff and students

h1. establishing effective project governance, reporting, document handling, progress monitoring, escalation and team working arrangements

h2. establishing effective communication with all project stakeholders

h3. establishing a robust and scalable installation of WebCT Vista from June 06

h4. providing system and application administration of WebCT Campus Edition until it is decommissioned in 07/08

h5. including WebCT support within a unified front-line ISU help desk and routing queries to those best placed to help

h6. integrating WebCT Vista with MMU systems to provide automated student account provisioning and LDAP authentication from Sept 06

h7. disseminating good e-Learning practice and supporting Faculties and Services in achieving it through staged WebCT Vista deployment and the ongoing process of setting and realising appropriate e-Learning targets

h8. migrating existing assets to WebCT Vista and establishing procedures for managing e-Learning assets that optimise local ownership, reduce duplication and enhance quality and consistency

h9. developing staff confidence and competence in using Vista for curriculum innovation and flexible delivery

h10. providing reports on the use of WebCT Vista that give a meaningful indication of students' engagement with e-Learning

h11. identifying, resolving with other stakeholders or escalating where appropriate business process and policy issues surrounding the project

h12. evaluating, adopting and monitoring the business case for MLE enhancement tools

h13. defining appropriate indicators of project success and risk exposure and monitoring them objectively

w1. support a high quality location-independent experience for staff and students that encourages and stimulates independent, autonomous learners

w2. increase the flexibility and responsiveness with which faculties can pursue curriculum modernisation and make more innovative use of teaching and learning spaces

w3. build capacity within ISU for supporting core, enterprise applications

Iteration 2 - Comparison of MLE Project Model and Stakeholder Criteria

MLE Project Model 0708	Ranked Stakeholder Criteria 0708	Usage (SYS)	Usability (SYS)	Availability (SYS)	Performance (SYS)	Support (RKU)	Expectations (STU)	Culture(STA)	Change (IBP)	Training (RKU)	Experience (STU)	Routines (STA)	Workload (STA)	Development (PM)	Admin (IBP)	Programme Management(IBP)	Experience (STA)	Sharing Best Practices (RKU)	Expectations (STA)	Culture (STU)	Achievement / Progression (STU)	Public Confidence (IU)	Learning Facilities Provision (IU)	Communications (PM)	Understanding Value Added (RKU)
	d1	✓	--	✓	✓	✓	--	✓	✓	--	--	--	--	--	--	--	--	--		✓	--	--	--	--	--
	h1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓	--
	h2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓	--
	h3	--	--	--	✓	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	h4	--	--	--	✓	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	h5	--	--	--	--	✓	--	--	✓	--	✓	--	--	--	--	--	✓	--	--	--	--	--	--	--	--
	h6	--	--	--	✓	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	h7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓	✓	--	--	--	--	--	--	--
	h8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓	--	--	--	--	--	--	--	--
	h9	--	--	--	--	--	--	--	--	✓	--	--	--	--	--	--	✓	--	--	--	--	--	--	--	✓
	h10	✓	--	--	--	--	--	--	--	--	✓	--	--	--	--	--	--	--	--	--	✓	--	--	--	--
	h11	--	--	--	--	--	--	--	✓	--	--	--	--	✓	✓	✓	✓	--	--	--	--	--	--	--	--
	h12	--	✓	--	--	--	--	--	--	--	--	--	--	✓	--	--	--	--	--	--	--	--	--	--	--
	h13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	w1	--	--	✓	--	--	--	✓	--	--	✓	--	--	--	--	--	✓	--	--	✓	✓	--	--	--	--
	w2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓	--	--	--	--	--	--	✓	--	--
	w3	--	--	--	--	✓	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	w4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Key: (from project model: d = do what | h = how | w = why)

d1. establish a robust, scalable, well-supported and well integrated e-learning Environment for all staff and students

h1. establishing effective project governance, reporting, document handling, progress monitoring, escalation and team working arrangements

h2. establishing effective communication with all project stakeholders

h3. establishing a robust and scalable installation of WebCT Vista from June 06

h4. providing system and application administration of WebCT Campus Edition until it is decommissioned in 07/08

h5. including WebCT support within a unified front-line ISU help desk and routing queries to those best placed to help

h6. integrating WebCT Vista with MMU systems to provide automated student account provisioning and LDAP authentication from Sept 06

h7. disseminating good e-Learning practice and supporting Faculties and Services in achieving it through staged WebCT Vista deployment and the ongoing process of setting and realising appropriate e-Learning targets

h8. migrating existing assets to WebCT Vista and establishing procedures for managing e-Learning assets that optimise local ownership, reduce duplication and enhance quality and consistency

h9. developing staff confidence and competence in using Vista for curriculum innovation and flexible delivery

h10. providing reports on the use of WebCT Vista that give a meaningful indication of staff and students' engagement with e-Learning

h11. identifying, resolving with other stakeholders or escalating where appropriate business process and policy issues surrounding the project

h12. evaluating, adopting and monitoring the business case for MLE enhancement tools

h13. defining appropriate indicators of project success and risk exposure and monitoring them objectively

w1. support a high quality location-independent experience for staff and students that encourages and stimulates independent, autonomous learners

w2. increase the flexibility and responsiveness with which faculties can pursue curriculum modernisation and make more innovative use of teaching and learning spaces

w3. build capacity within ISU for supporting core, enterprise applications

w4. Meet and develop expectations of stakeholders for Technology Supported Learning (TSL)

Iteration 3 - Comparison of MLE Project Model and Stakeholder Criteria

MLE Project Model 0809	Ranked Stakeholder Criteria 0809	Performance (SYS)	Requirements (SYS)	Achievement / Progression (STU)	Support (RKU)	Training (RKU)	Usability (SYS)	Expectations (STU)	Programme Management(IBP)	Usage (SYS)	Change Management (IBP)	Culture(STA)	Workload (STA)	Assessment Process (IBP)	Experience (STU)	Culture (STU)	The Future (PM)	Understanding Value Added (RKU)	Sharing Best Practices (RKU)	Technical Support (sys)	Availability (SYS)
	d1	✓	--	--	✓	--	--	--	--	✓	--	✓	--	--	--	✓	--	--	--	✓	✓
	h1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	h2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	h3	✓	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	h4	--	--	--	✓	--	--	--	--	--	--	--	--	--	✓	--	--	--	--	✓	--
	h5	✓	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	h6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓	--	--
	h7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	h8	--	--	--	--	✓	--	--	--	--	--	--	--	--	--	--	--	✓	--	--	--
	h9	--	--	✓	--	--	--	--	--	✓	--	--	--	--	✓	--	--	--	--	--	--
	h10	--	--	--	--	--	--	--	✓	--	✓	--	--	✓	--	--	--	--	--	--	--
	h11	--	✓	--	--	--	✓	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	h12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	w1	--	--	✓	--	--	--	--	--	--	--	✓	--	--	✓	✓	--	--	--	--	✓
	w2	--	--	--	--	--	--	--	✓	--	--	--	--	--	--	--	--	--	--	--	--
	w3	--	--	--	✓	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓	--
	w4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Key: (from project model: d = do what | h = how | w = why)

d1. establish a robust, scalable, well-supported and well integrated e-learning Environment for all staff and students

h1. establishing effective project governance, reporting, document handling, progress monitoring, escalation and team working arrangements

h2. establishing effective communication with all project stakeholders

h3. establishing a robust and scalable installation of WebCT Vista from June 06

h4. including WebCT support within a unified front-line ISU help desk and routing queries to those best placed to help

h5. integrating WebCT Vista with MMU systems to provide automated student account provisioning and LDAP authentication from Sept 06

h6. disseminating good e-Learning practice and supporting Faculties and Services in achieving it through staged WebCT Vista deployment and the ongoing process of setting and realising appropriate e-Learning targets

h7. migrating existing assets to WebCT Vista and establishing procedures for managing e-Learning assets that optimise local ownership, reduce duplication and enhance quality and consistency

h8. developing staff confidence and competence in using Vista for curriculum innovation and flexible delivery

h9. providing reports on the use of WebCT Vista that give a meaningful indication of staff and students' engagement with e-Learning

h10. identifying, resolving with other stakeholders or escalating where appropriate business process and policy issues surrounding the project

h11. evaluating, adopting and monitoring the business case for MLE enhancement tools

h12. defining appropriate indicators of project success and risk exposure and monitoring them objectively

w1. support a high quality location-independent experience for staff and students that encourages and stimulates independent, autonomous learners

w2. increase the flexibility and responsiveness with which faculties can pursue curriculum modernisation and make more innovative use of teaching and learning spaces

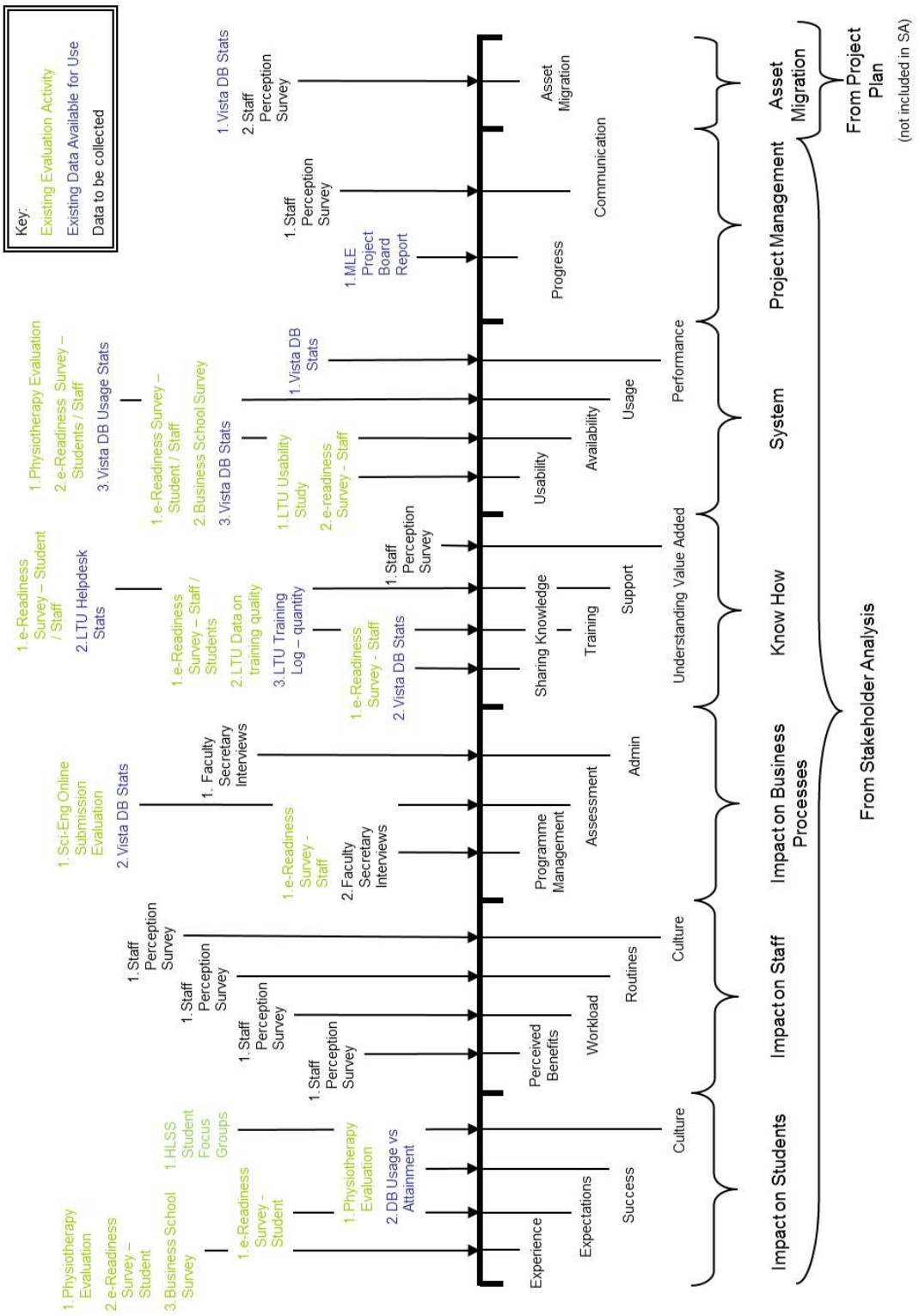
w3. build capacity within ISU for supporting core, enterprise applications

w4. Meet and develop expectations of stakeholders for Technology Supported Learning (TSL)

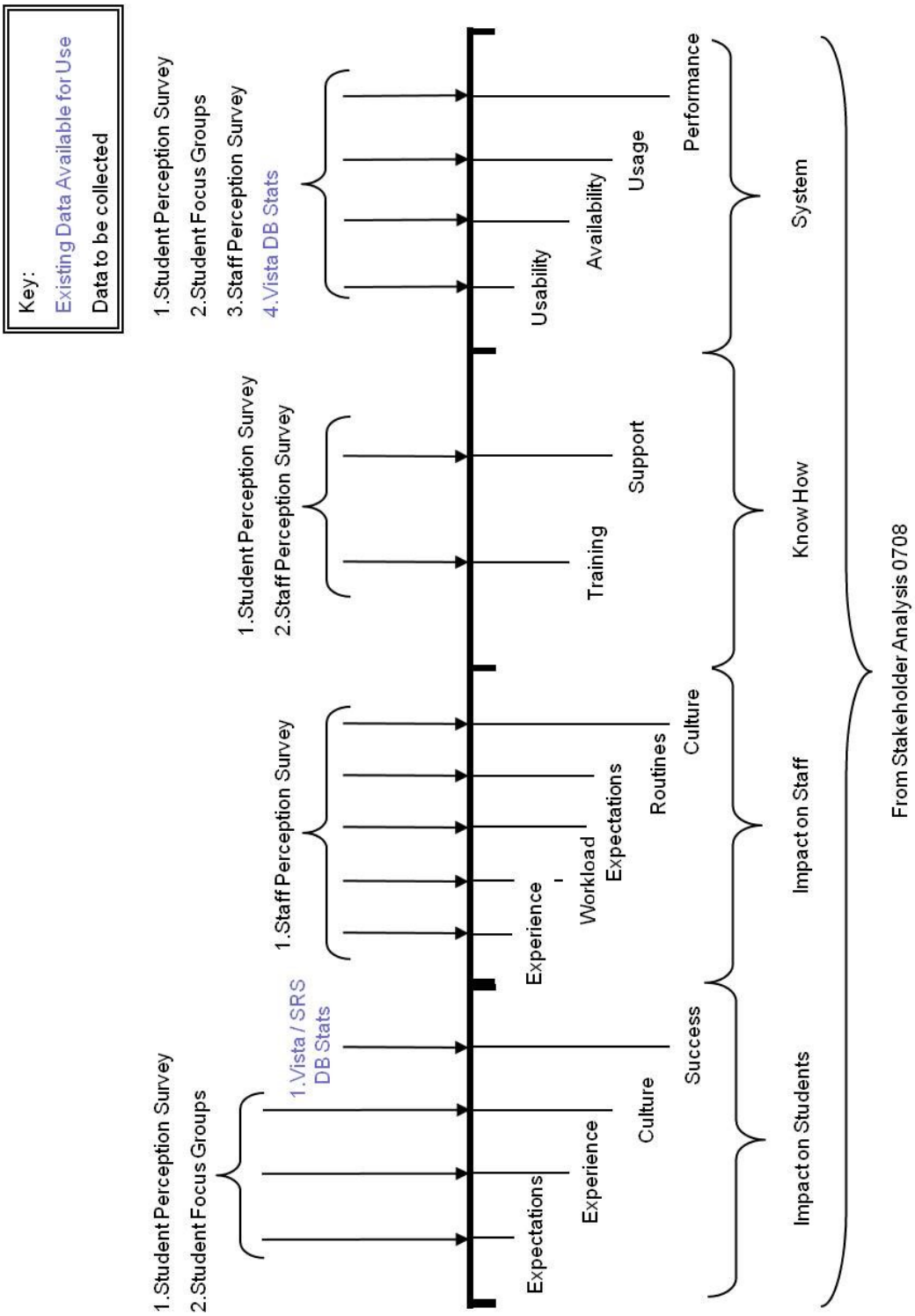
APPENDIX C – EVALUATION PLANS

The following pages show the Evaluation Plans for each iteration

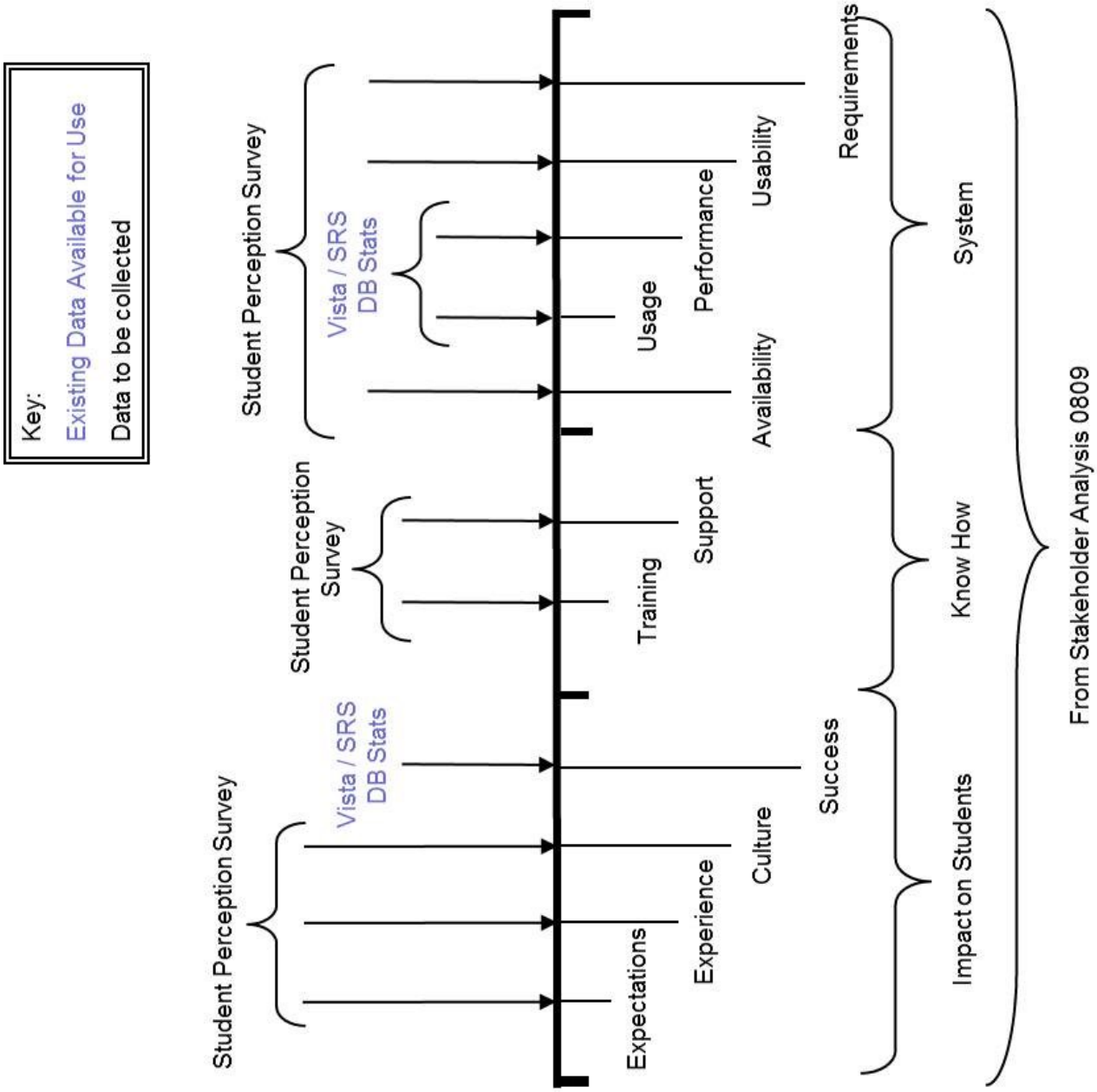
Iteration 1 - Evaluation Plan



Iteration 2 - Evaluation Plan



Iteration 3 - Evaluation Plan



APPENDIX D – ONLINE SURVEYS – STAFF AND STUDENT

The following pages show the relevant online surveys for both staff and students across all 3 iterations.

Iteration 1 - Online Staff Survey

VISTA STAFF PERCEPTION SURVEY 06/07

Welcome

Welcome to the WebCT Vista Staff Survey

The purpose of this survey is to gain an understanding of WebCT Vista from the point of view of Academic Staff at MMU. Categories and questions have been derived from stakeholder interviews.

Your input is vital in shaping the WebCT Vista project. We are interested in your experience so far and your plans and needs going forward.

The survey is completely anonymous and should only take a few minutes to complete. Thank you in advance for you time.

Once completed, please press the submit button found at the bottom of this page

Your Vista Usage

1	How often do you log on to Vista:	Never	Less than once a month	Once or twice a month	Weekly	More than once a week	Daily
		○	○	○	○	○	○

2	Where have you accessed Vista from?	On Campus	Home	Other University	Internet Cafe	WAP Mobile Phone	PDA
		☐	☐	☐	☐	☐	☐

3	How many units do you use Vista for:	None	1	2	3	4	5 or more
		○	○	○	○	○	○

4	Is the use of Vista compulsory for your students?	Compulsory	Not Compulsory
		○	○

5	To what extent do you use the following features:	Not at all	On some courses	On all courses	Hope to next year	Would like to but need more info / support
	Announcements	○	○	○	○	○
	Course Information	○	○	○	○	○
	Course Documentation	○	○	○	○	○
	Staff Information	○	○	○	○	○
	Assignments	○	○	○	○	○
	Surveys	○	○	○	○	○
	Quizzes	○	○	○	○	○
	Email	○	○	○	○	○

Discussion Boards	○	○	○	○	○
Chat	○	○	○	○	○
Group Pages	○	○	○	○	○
External Links	○	○	○	○	○
Assignment Drop Box	○	○	○	○	○
Course Calendar	○	○	○	○	○
RSS Feeds	○	○	○	○	○
Turnitin Submission	○	○	○	○	○
Podcasts	○	○	○	○	○
Goals	○	○	○	○	○

6	When adding content, to what extent do you use the following:	Not at all	On some courses	On all courses	Hope to next year	Would like to but need more info / support
	Use folders to organise	○	○	○	○	○
	Use templates	○	○	○	○	○
	Attach files eg word / excel / powerpoint	○	○	○	○	○
	Link to Web Pages	○	○	○	○	○
	Create Web Pages	○	○	○	○	○
	Turn buttons / features on/off	○	○	○	○	○
	Customise Icons	○	○	○	○	○
	Add images	○	○	○	○	○
	Add video	○	○	○	○	○
	Add audio	○	○	○	○	○
	Add animations / simulations	○	○	○	○	○

7	What is your intended use of Vista next year in comparison with this year?	Increase Usage	Same as this year	Decrease Usage
	Amount of Content:	○	○	○
	Number of features:	○	○	○

Resource Migration

8	When you started using Vista at the start of this academic year, did you have existing resources in an alternative Virtual Learning Environment such as a local intranet or WebCT Campus?	Yes	No
		○	○

9	If so, was it important to you that existing resources were moved into Vista?	Yes	No
		○	○

10	Did you move these resources into Vista?	Yes	No
		○	○

11	If so, how easy was it?	Very Easy	Fairly Easy	Difficult	Very Difficult
		○	○	○	○

12	Did you require assistance when moving your resources into Vista?	Yes	No
		○	○

13	If so, who assisted you?	Faculty Champion	Learning and Teaching Unit	Other
		○	○	○ Name

14	If you didn't move existing resources to Vista, would you have prefered to have done?	Yes	No
		○	○

15	If you would have prefered to have moved your resources to Vista but didn't, why not?	Comments:

Workload And Working Practices

16	On average, how much time per week do you spend per unit in Vista?	Less than 1 hr per week	Between 1hr – 3 hrs per week	More than 3 hrs per week
	Maintaining / updating	○	○	○
	New development	○	○	○
	Communicating (email / announcements)	○	○	○
	Emoderating (discussion boards / virtual chat)	○	○	○

17	How has the use of Vista affected your workload?	Created more work	No change	Created less work
		○	○	○

18	In what areas has more work been created?	Comments:

19	In what areas has less work been created?	Comments:
20	In what areas of your work has the use of Vista made things easier?	Comments:
21	In what areas of your work has the use of Vista made things harder?	Comments:
22	What effect has Vista had on your role?	Comments:

Training And Support

23	How easy do you find Vista to use?	Easy	Fairly Easy	Fairly Difficult	Difficult	Very Difficult
		○	○	○	○	○

24	How long did it take you to gain confidence in using Vista?	A Week	A Month	One Term	Two Terms	Still not confident
		○	○	○	○	○

25	Have you had any training?	Yes	No
		○	○

26	If so, what type of training have you had?	Introduction to Vista	Template Use & Student Management	Communications	Content Management	One-to-One
	(select all that apply)	☐	☐	☐	☐	☐

27	Do you need any further training?	Yes	No
		○	○

28	If so, what type of further training do you need?	Introduction to Vista	Template Use & Student Management	Communications	Content Management	One-to-One
	(select all that apply)	☐	☐	☐	☐	☐

29	How satisfied are you with the support you have receive for Vista this year?	Very Satisfied	Satisfied	Neither Satisfied nor Dissatisfied	Dissatisfied	Very Dissatisfied
		○	○	○	○	○

Impact Of Vista

30	If you have used the following in Vista, what effect do you think these have had on your teaching?	Positive	No change	Negative
	Lecture materials	○	○	○
	Interactive resources	○	○	○
	Discussion groups / chat	○	○	○
	Assessment e.g. surveys / quizzes	○	○	○

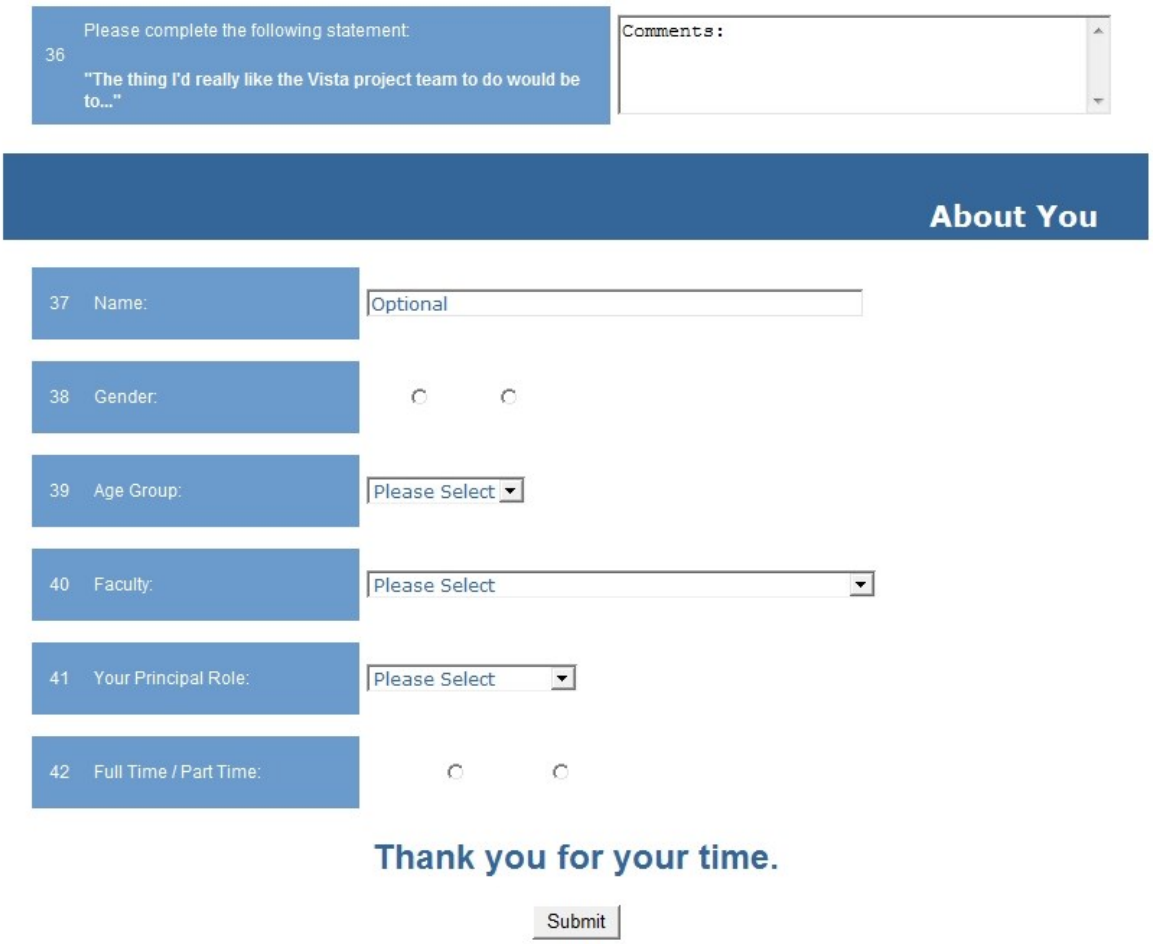
31	In general, for lectures, please select the resources that you make available in Vista and when you make them available.	Use?	Make Available Before Lectures	Make Available After Lectures
	Lecture Notes / Handouts / Case Studies	☐	○	○
	Video / Audio	☐	○	○
	Lecture Slides	☐	○	○
	Other (Please Specify) Name	☐	○	○

32	If you put resources onto Vista, which of the following do you think best describes the impact on your students' activity during lectures	Note taking has increased	Note takling has stayed the same	Note taking has descreased	No longer take notes	No longer attend lectures
		○	○	○	○	○

33	Overall how do you rate the effectiveness of Vista as a learning resource?	Very Good	Good	Poor	Very Poor
		○	○	○	○

34	Vista:	Strongly Agree	Agree	Disagree	Strongly Disagree
	Helps with managing my unit more effectively	○	○	○	○
	Improves collaboration with colleagues	○	○	○	○
	Improves communication with students	○	○	○	○
	Is more effective for keeping things up to date	○	○	○	○
	Provides a better overview of the unit as a whole	○	○	○	○

35	Overall....	Strongly Agree	Agree	Disagree	Strongly Disagree
	I am very satisfied with Vista	○	○	○	○
	I feel Vista has enhanced my staff experience	○	○	○	○
	Vista has exceeded my expectations	○	○	○	○
	Vista allows for new opportunities to be explored	○	○	○	○


36 Please complete the following statement:
"The thing I'd really like the Vista project team to do would be to..."
Comments:
About You
37 Name:
Optional
38 Gender:
39 Age Group:
Please Select
40 Faculty:
Please Select
41 Your Principal Role:
Please Select
42 Full Time / Part Time:
Thank you for your time.
Submit

Iteration 1 - Online Staff Survey

E-LEARNING STAFF PERCEPTION SURVEY 07/08

Welcome

Welcome to the E-Learning Staff Survey

COMPLETE THE SURVEY FOR THE CHANCE TO WIN £50 AMAZON VOUCHERS

The purpose of this survey is to gain an understanding of the use of e-learning systems especially WebCT Vista from the point of view of Academic Staff at MMU. Categories and questions have been derived from previous stakeholder interviews.

Your input is vital in shaping the WebCT Vista project. We are interested in your experience so far and your plans and needs going forward.

The survey is completely anonymous and should only take a few minutes to complete. Thank you in advance for you time.

Once completed, please press the submit button found at the bottom of this page

Your Usage

1	What online systems do you use for e-learning?	WebCT Vista	Faculty or department based Intranet / Shared Drive	External system for e-learning i.e. facebook discussion groups
	(select all that apply)	☐	☐	Please state

2	How often do you log on to:	Never	Less than once a month	Once or twice a month	Weekly	More than once a week	Daily
	WebCT Vista	○	○	○	○	○	○
	Local intranet / shared drive	○	○	○	○	○	○
	External system for e-learning	○	○	○	○	○	○

3	Where have you accessed your e-learning system from?	On Campus	Home	Other University	Internet Cafe	WAP Mobile Phone	PDA
	(select all that apply)	☐	☐	☐	☐	☐	☐

4	How many units do you use the following for:	None	1	2	3	4	5 or more
	WebCT Vista	○	○	○	○	○	○
	Local intranet / shared drive	○	○	○	○	○	○
	External system for e-learning	○	○	○	○	○	○

5	Is the use of e-learning systems compulsory for your students?	Compulsory	Not Compulsory
		○	○

6	To what extent do you use the following features:	Not at all	On some courses	On all courses	Hope to next year	Would like to but need more info / support
	Announcements	○	○	○	○	○
	Course Information	○	○	○	○	○
	Course Documentation	○	○	○	○	○
	Staff Information	○	○	○	○	○
	Assignments	○	○	○	○	○
	Surveys	○	○	○	○	○
	Quizzes	○	○	○	○	○
	Email	○	○	○	○	○
	Discussion Boards	○	○	○	○	○
	Chat	○	○	○	○	○
	Group Pages	○	○	○	○	○
	External Links	○	○	○	○	○
	Assignment Drop Box	○	○	○	○	○
	Course Calendar	○	○	○	○	○
	RSS Feeds	○	○	○	○	○
	Turnitin Submission	○	○	○	○	○
	Podcasts	○	○	○	○	○
	Goals	○	○	○	○	○

7	When adding content, to what extent do you use the following:	Not at all	On some courses	On all courses	Hope to next year	Would like to but need more info / support
	Use folders to organise	○	○	○	○	○
	Use templates	○	○	○	○	○
	Attach files eg word / excel / powerpoint	○	○	○	○	○
	Link to Web Pages	○	○	○	○	○
	Create Web Pages	○	○	○	○	○
	Turn buttons / features on/off	○	○	○	○	○
	Customise Icons	○	○	○	○	○
	Add images	○	○	○	○	○
	Add video	○	○	○	○	○
	Add audio	○	○	○	○	○

Create Web Pages					
Turn buttons / features on/off					
Customise Icons					
Add images					
Add video					
Add audio					
Add animations / simulations					

8	Please select the e-learning resources you use for lectures and indicate when you make them available.	Use?	Make Available Before Lectures	Make Available After Lectures
	Lecture Notes / Handouts / Case Studies			
	Video / Audio			
	Lecture Slides			
	Other Please State			

9	What is your intended use of e-learning next year in comparison with this year?		Increase Usage	Same as this year	Decrease Usage
	Vista	Amount of Content:			
		Number of features:			
	Local intranet / shared drive	Amount of Content:			
		Number of features:			
	External system for e-learning	Amount of Content:			
		Number of features:			

Your Migration

10	If you started using Vista at the start of this academic year, did you have existing resources in an alternative Virtual Learning Environment such as a local intranet or WebCT Campus?	Yes	No	Not Applicable (Please move to next section)

11	If so, was it important to you that existing resources were moved into Vista?	Yes	No

12	Did you move these resources into Vista?	Yes	No

13	If so, how easy was it?	Very Easy	Fairly Easy	Difficult	Very Difficult
		○	○	○	○

14	Did you require assistance when moving your resources into Vista?	Yes	No
		○	○

15	If so, who assisted you?	Faculty Champion	Centre for Learning and Teaching (CeLT)	Other
		○	○	Name

16	If you didn't move existing resources to Vista, would you have prefered to have done?	Yes	No
		○	○

17	If you would have prefered to have moved your resources to Vista but didn't, why not?	Comments:

Your Workload And Working Practices

18	On average, how much time per week do you spend on e-learning per unit?	Less than 1 hr per week	Between 1hr – 3 hrs per week	More than 3 hrs per week
	Maintaining / updating	○	○	○
	New development	○	○	○
	Communicating (email / announcements)	○	○	○
	Emoderating (discussion boards / virtual chat)	○	○	○

19	Do you currently have any time allowance within your contract for development / management of e-learning?	Yes	No
		○	○

20	How has the use of e-learning affected your workload?	Created more work	No change	Created less work
		○	○	○

21	In what areas has more work been created?	Comments:

22	In what areas has less work been created?	Comments:

23	In what areas of your work has the use of Vista made things easier?	Comments:
24	In what areas of your work has the use of Vista made things harder?	Comments:
25	What effect has Vista had on your role?	Comments:

Your Training And Support

26	How easy do you find the following to use?	Easy	Fairly Easy	Fairly Difficult	Difficult	Very Difficult
	Vista	○	○	○	○	○
	Local intranet / shared drive	○	○	○	○	○

27	How long did it take you to gain confidence in using the following?	A Week	A Month	One Term	Two Terms	Still not confident
	Vista	○	○	○	○	○
	Local intranet / shared drive	○	○	○	○	○

28	Have you had any training in using Vista?	Yes	No
		○	○

29	If so, what type of training have you had in using Vista?	Introduction to Vista	Template Use & Student Management	Communications	Content Management	One-to-One
	(select all that apply)	☐	☐	☐	☐	☐

30	Do you need any further training in using Vista?	Yes	No
		○	○

31	If so, what type of further training do you need in using Vista?	Introduction to Vista	Template Use & Student Management	Communications	Content Management	One-to-One
	(select all that apply)	☐	☐	☐	☐	☐

32	How satisfied are you with the support you have receive for the following this year?	Very Satisfied	Satisfied	Neither Satisfied nor Dissatisfied	Dissatisfied	Very Dissatisfied
	Vista	○	○	○	○	○
	Local intranet / shared drive	○	○	○	○	○

Your Thoughts And Feelings

33	If you have used the following for e-learning, what effect do you think these have had on your teaching?	Positive	No change	Negative
	Lecture materials	○	○	○
	Interactive resources	○	○	○
	Discussion groups / chat	○	○	○
	Assessment e.g. surveys / quizzes	○	○	○

34	What is your motivation for using e-learning? (tick all that apply)	
	Enhance my teaching	☐
	I'm curious about the software	☐
	My department wants me to use it	☐
	Enhance my ITC skills	☐
	My students want it	☐
	Improve student learning	☐
	Other	Please state

35	If you put resources onto an e-learning system, which of the following do you think best describes the impact on your students' activity during lectures?	Note taking has increased	Note takling has stayed the same	Note taking has descreased	No longer take notes	No longer attend lectures
		○	○	○	○	○

36	Overall, how do you rate the effectiveness of the following as a learning resource?	Very Good	Good	Poor	Very Poor
	Vista	○	○	○	○
	Local intranet / shared drive	○	○	○	○
	External system for e-learning	○	○	○	○

37	E-Learning:	Strongly Agree	Agree	Disagree	Strongly Disagree
	Helps with managing my unit more effectively	○	○	○	○
	Improves collaboration with colleagues	○	○	○	○
	Improves communication with students	○	○	○	○
	Improves students' learning	○	○	○	○
	Improves students' achievement	○	○	○	○
	Is more effective for keeping things up to date	○	○	○	○
	Provides a better overview of the unit as a whole	○	○	○	○

38	Overall....	Strongly Agree	Agree	Disagree	Strongly Disagree
	I am very satisfied with Vista	○	○	○	○
	I feel Vista has enhanced my staff experience	○	○	○	○
	Vista meets my expectations	○	○	○	○
	Vista allows for new opportunities to be explored	○	○	○	○
	I am happy to use Vista as part of my teaching	○	○	○	○

39	Please complete the following statement: "The thing I'd really like the Vista project team to do would be to..."	Comments:

About You

40	Name:	Optional
41	Your email:	Optional (this information will be used for contacting you if you win the prize draw. Only those who supply details will be eligble for the draw...we won't know who you are otherwise!)
42	Gender:	Male ○ Female ○
43	Age Group:	Please Select
44	Academic Department:	Please Select
45	Your Principal Role:	Please Select

Thank you for your time.

Submit

Iteration 2 - Online Student Survey

STUDENT E-LEARNING FEEDBACK SURVEY 07/08

Welcome to the Student E-Learning Feedback Survey 07/08

COMPLETE THE SURVEY FOR THE CHANCE TO WIN £50 AMAZON VOUCHERS

The purpose of this survey is to gain an understanding of the e-learning systems you use e.g. WebCT Vista from the point of view of students at MMU. Categories and questions have been derived from stakeholder interviews. Your input is vital in shaping the future of e-learning. We are interested in your experience so far and your needs going forward.

For clarification, the term e-learning systems refers to those systems that you use to access information provided by your academic staff to support your learning. This can include lecture materials, such as slides, and links to external resources. Across MMU various systems are being used. These include WebCT Vista, faculty based Intranets, and Shared Drives.

The survey is completely anonymous and should only take a few minutes to complete.

Once completed, please press the submit button found at the bottom of this page. Thank you in advance for you time.

Your Access

		Yes	No
1	Do you have consistent and convenient access to a computer outside of University?	○	○
2	Do you have a reliable internet connection outside of University?	○	○
3	If you have an internet connection, does your internet access tie up your phone and inconvenience others?	○	○
4	If you have access to the internet outside of university, is it a broadband connection?	○	○
5	Have you experienced any problems accessing your e-learning system(s)?	○	○

		Access to a computer outside of university	Access to an internet connection outside of university	Unable to login to Vista	Platform problems e.g. Java version on your computer	Module(s) you are taking not available in Vista	Other
6	If so, what were they? (select all that apply)	☐	☐	☐	☐	☐	Please state

7	If you have had problems accessing your e-learning system (s), how has this affected you and your studies?	Please state

Your Usage

8	What online systems do you use for e-learning?	WebCT Vista	Faculty or department based Intranet / Shared Drive	External system i.e. facebook discussion groups	Other
	(select all that apply)	☐	☐	☐	Please state

9	How often do you log on to:	Never	Less than once a month	Once or twice a month	Weekly	More than once a week	Daily
	WebCT Vista	○	○	○	○	○	○
	Local intranet / shared drive	○	○	○	○	○	○
	External e-learning system	○	○	○	○	○	○

10	Where have you accessed your e-learning system from?	On Campus	Home	Other University	Internet Cafe	WAP Mobile Phone	PDA
	(select all that apply)	☐	☐	☐	☐	☐	☐

11	How many units do you use the following for:	None	1	2	3	4	5 or more
	WebCT Vista	○	○	○	○	○	○
	Local intranet / shared drive	○	○	○	○	○	○
	External e-learning system	○	○	○	○	○	○

12	Is the use of e-learning compulsory for you?	Compulsory	Not Compulsory
		○	○

13	During this academic year,which tools have you used as part of your studies:	Not at all	On some courses	On all courses	Would like to but need more info / support
	Online lecture notes	○	○	○	○
	E-books / E-journals	○	○	○	○
	Online submission of assignments	○	○	○	○
	Online tests & quizzes	○	○	○	○
	Online library catalogue	○	○	○	○
	Online discussions / chat rooms	○	○	○	○
	Podcasts / online movies / audio clips	○	○	○	○
	Simulations / business games online	○	○	○	○
	Blogs / wikis	○	○	○	○

Your Training & Support

18	How easy do you find the following to use?	Easy	Fairly Easy	Fairly Difficult	Difficult	Very Difficult
	WebCT Vista	○	○	○	○	○
	Local intranet / shared drive	○	○	○	○	○

19	How long did it take you to gain confidence in using the following?	A Week	A Month	One Term	Two Terms	Still not confident
	WebCT Vista	○	○	○	○	○
	Local intranet / shared drive	○	○	○	○	○

20	Within the last academic year, have you received any training for the e-learning system(s) you use?	Yes	No
		○	○

21	If you have not had any training, would you like to receive training?	Yes	No
		○	○

22	If so, what type of training would you like to receive? (select all that apply)	Introduction to system	Navigation	Communication e.g. discussion boards	Uploading Documents	Other
	WebCT Vista	☐	☐	☐	☐	Please state
	Local intranet / shared drive	☐	☐	☐	☐	Please state

23	What type of support have you needed for e-learning this year? (select all that apply)	Help with using the system	Help with not being able to access the system	Help with not having all your modules available to you	Technical support	Other
	WebCT Vista	☐	☐	☐	☐	Please state
	Local Intranet / Shared Drive	☐	☐	☐	☐	Please state

24	How satisfied are you with the support you have receive for the following this year?	Very Satisfied	Satisfied	Neither Satisfied nor Dissatisfied	Dissatisfied	Very Dissatisfied
	WebCT Vista	○	○	○	○	○
	Local Intranet / Shared Drive	○	○	○	○	○

25	To whom would you go to for support for e-learning? (select all that apply)	Your local Information Systems helpdesk	Email WebCT helpdesk	Your tutors	Your friends / other students	Other	You don't know where to go for help
	WebCT Vista	☐	☐	☐	☐	Please state	☐
	Local Intranet / Shared Drive	☐	☐	☐	☐	Please state	☐

Your Thoughts And Feelings

26	Are you happy with the concept of using e-learning in your studies?	Yes	Sort of	No
		○	○	○

27	If not, why not?	You don't like using computers	You prefer not to use computers for your studies	Your learning style is not suited to e-learning	You prefer face-to-face contact with your tutors	Other
	(select all that apply)	☐	☐	☐	☐	Please state

28	Please select the appropriate statement	Strongly Disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
	I only use the e-learning content for my studies that are provided to me by my lecturers	○	○	○	○	○
	I use other resources such as academic journals to support information provided by my lecturers	○	○	○	○	○
	I feel that using e-learning helps me with my learning	○	○	○	○	○
	I don't have as much face-to-face contact with my tutors who use e- learning systems	○	○	○	○	○
	I feel I am more in touch with my tutors if they use the contact options available in the e-learning systems such as discussion boards	○	○	○	○	○
	Using WebCT Vista improves my student experience	○	○	○	○	○
	Using the local intranet / shared drive improves my student experience	○	○	○	○	○
	Vista meets my expectations	○	○	○	○	○
	The local intranet / shared drive meets my expectations	○	○	○	○	○

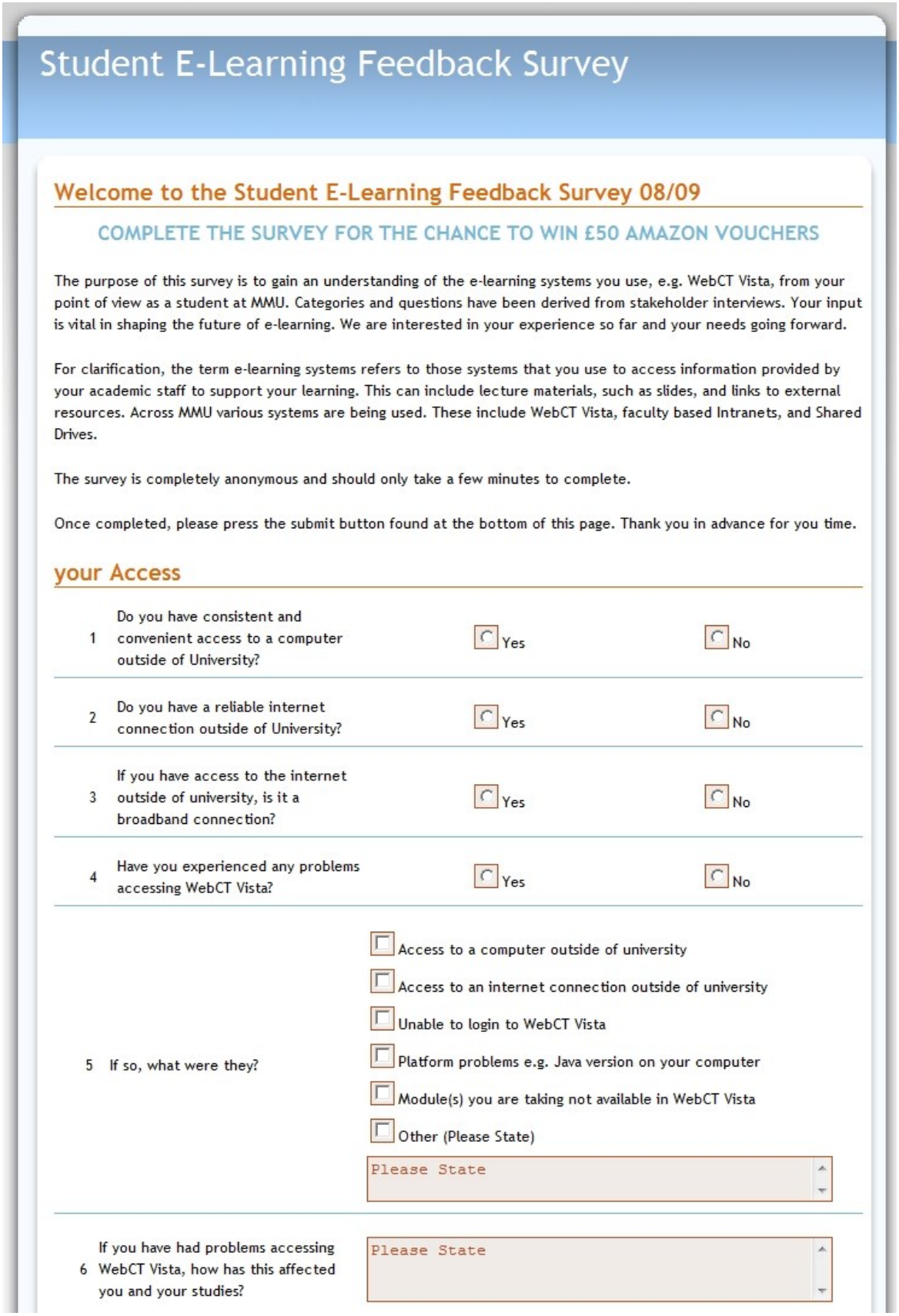
About You

29	Student ID:	Optional (this information will be used for research purposes only and will not be used to identify you individually)
30	Your email:	Optional (this information will be used for contacting you if you win the prize draw. Only those who supply details will be eligble for the draw...we won't know who you are otherwise!)
31	Gender:	Male ○ Female ○
32	Age Group:	Please Select
33	Level of Study:	Please Select
34	Academic Department:	Please Select

Thank you for your time...and Good Luck with the draw!!

Submit

Iteration 3 - Online Student Survey



Student E-Learning Feedback Survey

Welcome to the Student E-Learning Feedback Survey 08/09

COMPLETE THE SURVEY FOR THE CHANCE TO WIN £50 AMAZON VOUCHERS

The purpose of this survey is to gain an understanding of the e-learning systems you use, e.g. WebCT Vista, from your point of view as a student at MMU. Categories and questions have been derived from stakeholder interviews. Your input is vital in shaping the future of e-learning. We are interested in your experience so far and your needs going forward.

For clarification, the term e-learning systems refers to those systems that you use to access information provided by your academic staff to support your learning. This can include lecture materials, such as slides, and links to external resources. Across MMU various systems are being used. These include WebCT Vista, faculty based Intranets, and Shared Drives.

The survey is completely anonymous and should only take a few minutes to complete.

Once completed, please press the submit button found at the bottom of this page. Thank you in advance for you time.

your Access

1	Do you have consistent and convenient access to a computer outside of University?	Yes	No
2	Do you have a reliable internet connection outside of University?	Yes	No
3	If you have access to the internet outside of university, is it a broadband connection?	Yes	No
4	Have you experienced any problems accessing WebCT Vista?	Yes	No

5 If so, what were they?

- Access to a computer outside of university
- Access to an internet connection outside of university
- Unable to login to WebCT Vista
- Platform problems e.g. Java version on your computer
- Module(s) you are taking not available in WebCT Vista
- Other (Please State)

Please State

6 If you have had problems accessing WebCT Vista, how has this affected you and your studies?

Please State

your Usage

7 What online systems have you used for e-learning?

- [ ] WebCT Vista
- [ ] Faculty or department based Intranet / Shared Drive
- [ ] External system i.e. facebook discussion groups
- [ ] Other

Please State

8 During this academic year,which tools have you used as part of your studies: (Please indicate in the last column those tools you would like to use more)	On all courses	On some courses	Not at all	...but would like to use more (select all that apply)
Online lecture notes	○	○	○	☐
E-books / E-journals	○	○	○	☐
Online submission of assignments	○	○	○	☐
Online tests & quizzes	○	○	○	☐
Online library catalogue	○	○	○	☐
Online discussions / chat rooms	○	○	○	☐
Podcasts / online movies / audio clips	○	○	○	☐
Blogs / wikis	○	○	○	☐

9 If you have used e-learning resources this year, what impact has it had on your use of other university resources?	Used Less	Used about the same	Used more
Library	○	○	○
Computer drop-in centre	○	○	○
Group work rooms	○	○	○
Noticeboards	○	○	○
Programme offices / Student hubs	○	○	○
Student social spaces i.e. cafe's	○	○	○

10	Have you ever missed information regarding your programme of study? i.e. changes to lectures / assignment information	☐ Yes	☐ No

11	What would your preferred method of communication be for important information such as a lecture change?	☐ Student Email ☐ Personal email ☐ Notice pinned to noticeboard ☐ Notice on WebCT Vista ☐ Text Message ☐ RSS Feed ☐ Other Please State

12	Do all your modules in WebCT Vista have consistent content i.e. lecture slides available for all modules?	☐ Yes	☐ No
13	If not, would you like the content available in WebCT Vista to be consistent across all your modules?	☐ Yes	☐ No
14	What content, ideally, would you like to see for all your modules in WebCT Vista?	Please State	
15	Do all your modules in WebCT Vista have a consistent layout i.e. each module has the same look and feel?	☐ Yes	☐ No
16	If not, would you like all your modules in WebCT Vista to have a consistent layout?	☐ Yes	☐ No
17	If you modules do not have consistent content or layout, what impact has this had on your studies?	Please State	
18	Have you ever had any problems using WebCT Vista?	☐ Yes	☐ No
19	If you have had problems, what were they?	Please State	

your Training & Support

20	How easy do you find WebCT Vista to use?	Easy	Fairly Easy	Fairly Difficult	Difficult
		☐	☐	☐	☐

21	Within the last academic year, have you received any training for WebCT Vista?	Yes	No
22	Do you currently have any WebCT Vista training needs?	Yes	No
23	If so, what type of training would you like to receive? (select all that apply)	Introduction to WebCT Vista Navigation Communication e.g. discussion boards Uploading documents Other Please State	
24	How satisfied are you with the support you have receive for WebCT Vista this year?	Very Satisfied	Satisfied / Dissatisfied / Very Dissatisfied
25	If you are disatisfied with the support you have received, why?	Please State	
26	What type of support have you needed for WebCT Vista this year? (select all that apply)	Help with using the system Help with not being able to access the system Help with not having all your modules available to you Technical support Other Please State	
27	To whom would you go to for support with WebCT Vista? (select all that apply)	Your local Information Systems helpdesk Email WebCT helpdesk Your tutors Your friends / other students You don't know where to go for help Other Please State	

your Thoughts and Feelings

28	Are you happy with the concept of using e-learning in your studies?	Yes	No

29 If not, what is the principle reason why not?

- ☐ I don't like using computers
- ☐ I prefer not to use computers for my studies
- ☐ My learning style is not suited to e-learning
- ☐ I prefer face-to-face contact with my tutors
- ☐ Other

Please State

30 Please select the appropriate statement	Strongly Disagree	Disagree	Agree	Strongly agree
I only use the e-learning content for my studies that are provided to me by my lecturers	☐	☐	☐	☐
I use other resources such as academic journals to support information provided by my lecturers	☐	☐	☐	☐
I feel that using e-learning helps me with my learning	☐	☐	☐	☐
I don't have as much face-to-face contact with my tutors who use e- learning systems	☐	☐	☐	☐
I feel I am more in touch with my tutors if they use the contact options available in the e-learning systems such as discussion boards	☐	☐	☐	☐
Using WebCT Vista improves my student experience	☐	☐	☐	☐
WebCT Vista meets my expectations for layout	☐	☐	☐	☐
WebCT Vista meets my expectations for content	☐	☐	☐	☐

31 What was the best thing about using WebCT Vista this year?

Please State

32 The thing I'd really like to improve about WebCT Vista would be:

Please State

about You

33 Student ID:

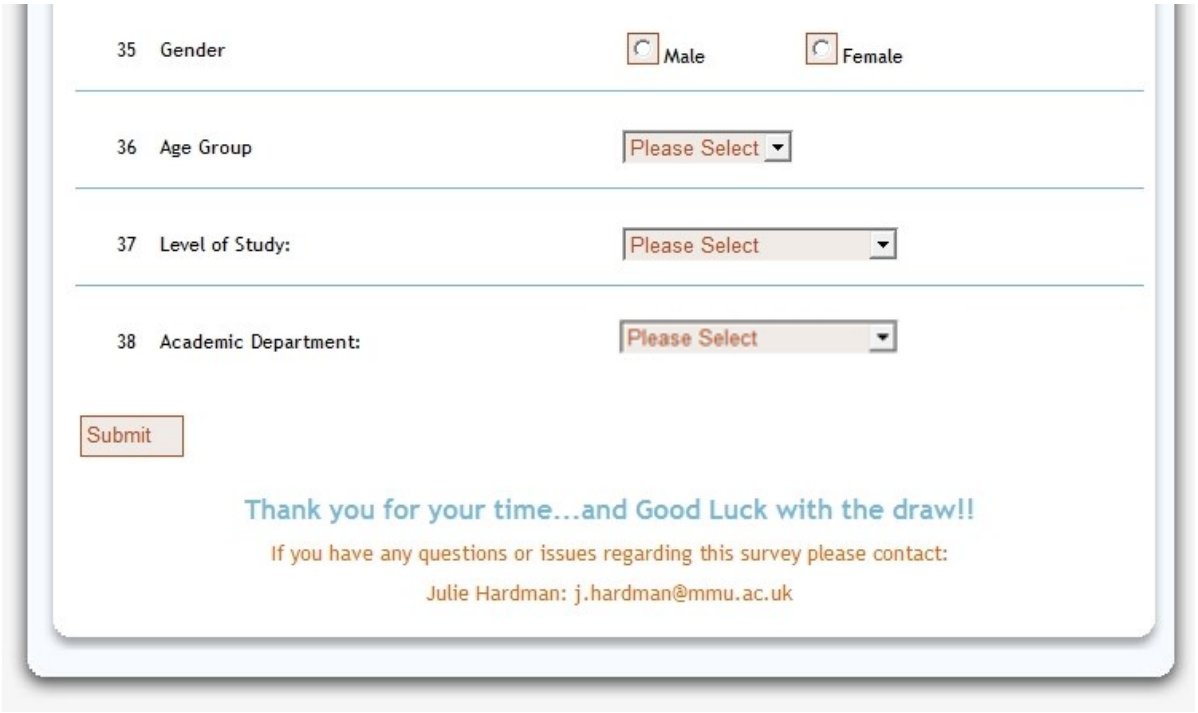
Optional

(this information will be used for research purposes only and will not be used to identify you individually)

34 Your email address:

Optional

(this information will be used for contacting you if you win the prize draw. Only those who supply details will be eligble for the draw...we won't know who you are otherwise!)


35 Gender
Male
Female
36 Age Group
Please Select
37 Level of Study:
Please Select
38 Academic Department:
Please Select
Submit
Thank you for your time...and Good Luck with the draw!!
If you have any questions or issues regarding this survey please contact:
Julie Hardman: j.hardman@mmu.ac.uk

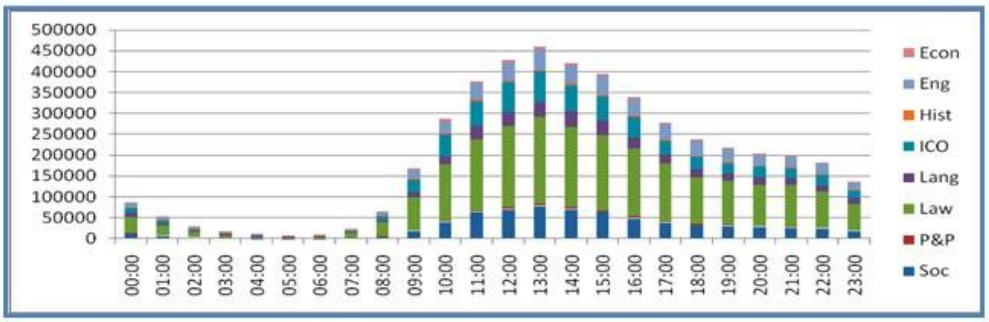
APPENDIX E – SAMPLE RESULTS

The following pages contain a sample of the results distributed to stakeholders from the second to the third iteration.

mle evaluation results 07/08: HLSS

Vista Student Usage Summary 07/08[1]

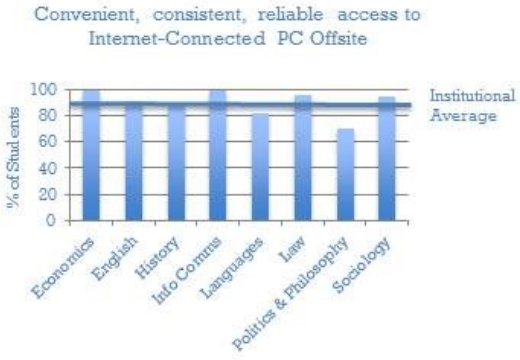
Department		Students in sample	Hits				Hits per student
			09:00-21:00	%	21:00-09:00	%	
Economics	F	45	14,352	76%	4,441	24%	418
	M	177	48,022	76%	14,986	24%	356
English	F	460	288,483	81%	66,299	19%	771
	M	258	139,846	79%	37,592	21%	688
History	F	43	13,290	85%	2,423	15%	365
	M	89	32,000	79%	8,471	21%	455
Info Comms	F	163	290,973	83%	59,385	17%	2,149
	M	154	277,706	82%	59,281	18%	2,188
Languages	F	289	183,011	83%	38,258	17%	766
	M	161	123,663	77%	36,059	23%	992
Law	F	928	1,114,315	82%	238,029	18%	1,457
	M	616	666,480	82%	146,203	18%	1,319
Politics & Philosophy	F	74	13,544	85%	2,344	15%	215
	M	141	29,411	80%	7,432	20%	261
Sociology	F	513	436,159	85%	76,743	15%	1,000
	M	208	144,984	83%	28,682	17%	835

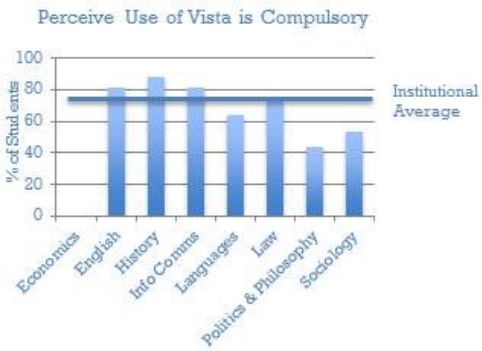


Student Attitudes Towards E-Learning & Vista 07/08[2]

Department	Students in Sample	*Computing Confidence	*E-Learning helps with learning	*Vista improves student experience	*Vista meets expectations
Economics	4	4.95	3.50	3.50	3.00
English	31	4.68	4.38	3.72	3.25
History	8	4.80	3.83	3.17	3.50
Info Comms	21	4.77	4.38	3.72	3.25
Languages	10	4.49	4.38	3.72	3.25
Law	23	4.64	3.81	3.29	3.24
Politics & Philosophy	7	4.88	4.14	3.86	3.43
Sociology	19	4.45	3.50	3.50	3.00
MMU	385	4.75	4.14	3.63	3.35

*Rating Scale: 1(Strongly Disagree) to 5 (Strongly Agree)





[1] From Vista Database [2] From Online Survey June 08 – August 08

Student Focus Group Summary*: HLSS

- **Experience of E-Learning Systems**
  - **Students generally happy with the concept of e-learning to support f2f teaching** but not to replace it
  - **WebCT Vista was reported** as a stand alone system or **part of a combination of multiple e-learning systems in use within faculties coupled with WebCT Campus**, local intranets or common drives
  - **Generally, operating multiple systems did not cause students problems although managing multiple systems was reported as causing some confusion with content location**
  - Where no e-learning systems were in use, student did not perceive it as being important to them in their studies
  - Where common drives were the primary e-learning tool there was general dissatisfaction although students liked access to previous years' materials
  - Greater contact with academics was reported where some form of online learning system was in use
  - A lack of resources available online resulted in a lack of use by students

- **Impact of use on learning / achievement**
  - **Where e-learning resources were made available the impact on learning / achievement was positive** especially when coupled with an active discussion forum.
  - When in use, students felt discussion forums assisted their learning due to interaction with other students and ability to look at others' questions / answers
  - When used, students were very positive about podcasts as an aid to learning. They felt it was like the lecturer was talking to them.
  - **Students liked the flexibility of accessing information 24/7** and felt it especially helped them when they were undertaking revision

- **Use of Web 2.0 technologies for e-learning i.e. facebook**
  - The majority of students were happy to use Web 2.0 technologies with some evidence of facebook use as a staff2stu and stu2stu discussion tool.
  - When in use, students reported facebook improved communication with staff. They felt they were more in touch with staff and it gave them a sense of 1-1 contact – "I can chat to him like a normal person"
  - Overall there was a reluctance to having academics as 'friends' in social online spaces although there were pockets of support for this particularly where it was already happening

- **Content Expectations**
  - **Students would like to see lecture materials** (prior to lecture), **notices** and links to external resources. Some also spoke of **discussion boards**, past exam papers, grades and timetable information.
  - **Nobody reported that their e-learning areas lived up to their expectation with very few modules giving access to this type of material.**

- **Consistency of Use**
  - **All reported a desire to see consistency of use with content**
  - **Nobody reported that consistency expectations were met.**

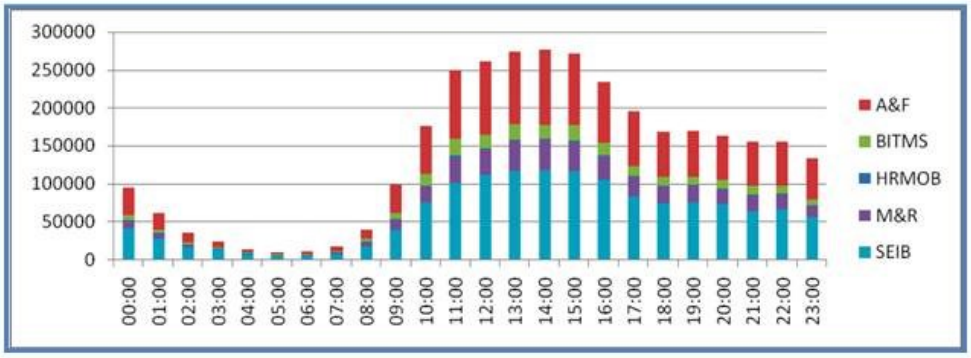
- **Student Experience**
  - Some students were satisfied but many were not - satisfaction came from those students who used a single system.
  - Students reported a positive impact on the students experience when it was used 'properly'
  - Promised content was not always delivered
  - Lack of resources online has led to frustration
  - Many reported navigation / usability issues which affected their experience

*Students = 48 across all faculties
Bold = data relating to this faculty

mle evaluation results 07/08: MMUBS

Vista Student Usage Summary 07/08[1]

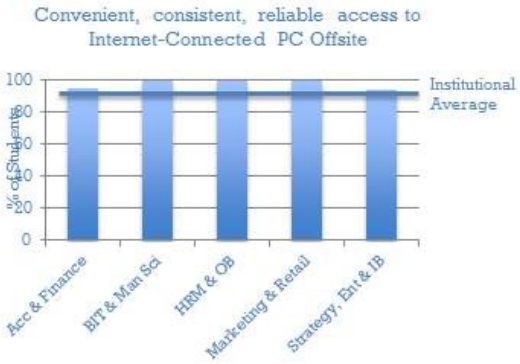
Department		Students in sample	Hits				Hits per student
			09:00-21:00	%	21:00-09:00	%	
Acc & Finance	F	307	377,906	77%	112,024	23%	1596
	M	512	533,244	76%	167,148	24%	1344
BIT & ManSci	F	38	67,620	78%	18,699	22%	2272
	M	147	118,972	79%	32,467	21%	1030
HRM & OB	F	131	10,174	83%	2,058	17%	93
	M	47	7,103	85%	1,226	15%	177
Marketing & Retail	F	204	180,577	77%	52,925	23%	1145
	M	206	157,582	79%	41,550	21%	967
Strategy, Ent & IB	F	486	452,585	79%	121,128	21%	1145
	M	864	633,537	76%	198,107	24%	963

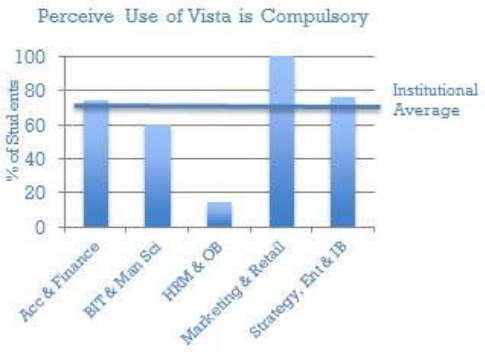


Student Attitudes Towards E-Learning & Vista 07/08[2]

Department	Students in Sample	*Computing Confidence	*E-Learning helps with learning	*Vista improves student experience	*Vista meets expectations
Acc & Finance	19	4.77	3.83	3.89	3.78
BIT & Man Sci	5	4.96	4.00	3.40	2.80
HRM & OB	7	4.88	4.17	3.17	2.67
Marketing & Retail	4	4.77	3.50	2.50	3.00
Strategy, Ent & IB	17	4.72	3.63	3.31	2.63
MMU	385	4.75	4.14	3.63	3.35

*Rating Scale: 1 (Strongly Disagree) to 5 (Strongly Agree)





[1] From Vista Database [2] From Online Survey June 08 – August 08

Student Focus Group Summary*: MMUBS

- **Experience of E-Learning Systems**
  - **Students generally happy with the concept of e-learning to support f2f teaching but not to replace it**
  - **WebCT Vista was reported as a stand alone system or part of a combination of multiple e-learning systems in use within faculties coupled with** WebCT Campus**, local intranets** or common drives
  - Generally, operating multiple systems did not cause students problems although **managing multiple systems was reported as causing confusion with content location**
  - Where no e-learning systems were in use, student did not perceive it as being important to them in their studies
  - Where common drives were the primary e-learning tool there was general dissatisfaction although students liked access to previous years' materials
  - Greater contact with academics was reported where some form of online learning system was in use
  - A lack of resources available online resulted in a lack of use by students

- **Impact of use on learning / achievement**
  - Where e-learning resources were made available the impact on learning / achievement was positive especially when coupled with an active discussion forum.
  - When in use, students felt discussion forums assisted their learning due to interaction with other students and ability to look at others' questions / answers
  - **When used, students were very positive about podcasts as an aid to learning. They felt it was like the lecturer was talking to them**.
  - Students liked the flexibility of accessing information 24/7 and felt it especially helped them when they were undertaking revision

- **Use of Web 2.0 technologies for e-learning i.e. facebook**
  - The majority of **students were happy to use Web 2.0 technologies with some evidence of facebook use as a staff2stu and stu2stu discussion tool.**
  - **When in use, students reported facebook improved communication with staff. They felt they were more in touch with staff and it gave them a sense of 1-1 contact – "I can chat to him like a normal person"**
  - Overall there was a reluctance to having academics as 'friends' in social online spaces although there were pockets of support for this particularly where it was already happening

- **Content Expectations**
  - **Students would like to see lecture materials** (prior to lecture), notices and links to external resources. **Some also spoke of past exam papers,** grades and timetable information.
  - **Nobody reported that their e-learning areas lived up to their expectation with very few modules giving access to this type of material.**

- **Consistency of Use**
  - **All reported a desire to see consistency of use with content**
  - **Nobody reported that consistency expectations were met.**

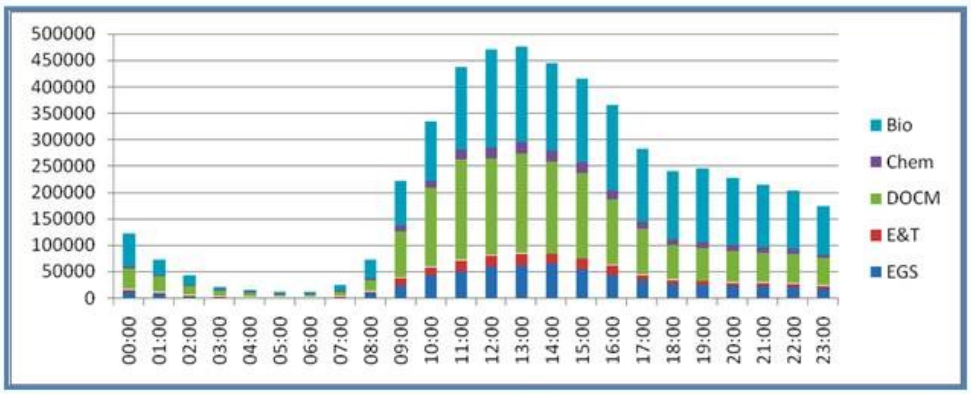
- **Student Experience**
  - Some students were satisfied but many were not - satisfaction came from those students who used a single system.
  - **Students reported a positive impact on the students experience when it was used 'properly'**
  - Promised content was not always delivered
  - Lack of resources online has led to frustration
  - **Many reported navigation / usability issues which affected their experience**

*Students = 48 across all faculties
Bold = data relating to this faculty

mle evaluation results 07/08: Sci-Eng

Vista Student Usage Summary 07/08[1]

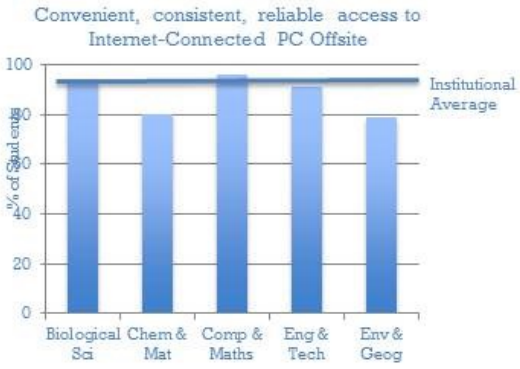
Department		Students in sample	Hits 09:00-21:00	%	Hits 21:00-09:00	%	Hits per student
Biological Sci	F	636	1,153,359	79%	304,526	21%	2,292
	M	411	593,243	76%	189,351	24%	1,904
Chem & Mat	F	206	90,235	81%	20,542	19%	538
	M	253	93,917	81%	21,736	19%	457
Comp & Maths	F	138	242,396	86%	40,783	14%	2,052
	M	821	1,291,650	83%	266,803	17%	1,898
Eng & Tech	F	51	19,106	82%	4,248	18%	458
	M	485	159,296	85%	27,480	15%	385
Env & Geog	F	217	296,263	83%	41,487	17%	1,142
	M	392	310,753	82%	65,971	18%	961

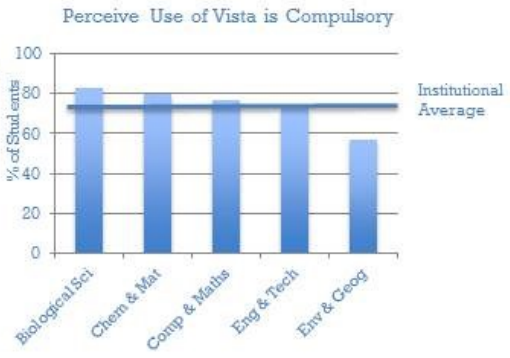


Student Attitudes Towards E-Learning & Vista 07/08[2]

Department	Students in Sample	*Computing Confidence	*E-Learning helps with learning	*Vista improves student experience	*Vista meets expectations
Biological Sci	36	4.78	4.27	3.90	3.73
Chem & Mat	8	4.45	4.00	4.14	3.57
Comp & Maths	23	4.80	4.00	3.15	2.60
Eng & Tech	11	4.71	3.36	3.55	2.91
Env & Geog	13	4.86	4.27	3.82	4.36
Institution AVG	385	4.75	4.14	3.63	3.35

*Rating Scale: 1(Strongly Disagree) to 5 (Strongly Agree)





[1] From Vista Database [2] From Online Survey June 08 – August 08

Student Focus Group Summary*:Sci-Eng

- **Experience of E-Learning Systems**
  - **Students generally happy with the concept of e-learning to support f2f teaching** but not to replace it
  - **WebCT Vista was reported as a stand alone system** or part of a combination of multiple e-learning systems in use within faculties coupled with WebCT Campus, local intranets or common drives
  - Generally, operating multiple systems did not cause students problems although managing multiple systems was reported as causing confusion with content location
  - Where no e-learning systems were in use, student did not perceive it as being important to them in their studies
  - Where common drives were the primary e-learning tool there was general dissatisfaction although students liked access to previous years' materials
  - **Greater contact with academics was reported where some form of online learning system was in use**
  - **A lack of resources available online resulted in a lack of use by students**

- **Impact of use on learning / achievement**
  - Where e-learning resources were made available **the impact on learning / achievement was positive especially when coupled with an active discussion forum.**
  - **When in use, students felt discussion forums assisted their learning due to interaction with other students and ability to look at others' questions / answers**
  - Students liked the flexibility of accessing information 24/7 and felt it especially helped them when they were undertaking revision

- **Use of Web 2.0 technologies for e-learning i.e. facebook**
  - **The majority of students were happy to use Web 2.0 technologies with some evidence of facebook use as a** staff2stu and **stu2stu discussion tool.**
  - When in use, students reported facebook improved communication with staff. They felt they were more in touch with staff and it gave them a sense of 1-1 contact – "I can chat to him like a normal person"
  - **Overall there was a reluctance to having academics as 'friends' in social online spaces** although there were pockets of support for this, particularly where it was already happening

- **Content Expectations**
  - **Students would like to see lecture materials (prior to lecture)**, notices and links to external resources. Some also spoke of past exam papers**, assignment information, grades** and timetable information.
  - **Nobody reported that their e-learning areas lived up to their expectation although a few modules gave access to this type of material.**

- **Consistency of Use**
  - **All reported a desire to see consistency of use with content**
  - **Nobody reported that consistency expectations were met.**

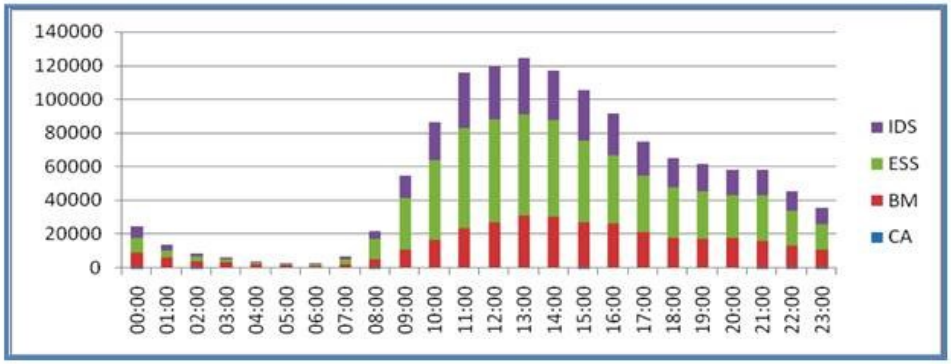
- **Student Experience**
  - Some **students were satisfied** but many were not - satisfaction came from those students who used a single system.
  - **Students reported a positive impact on the students experience when it was used 'properly'**
  - Promised content was not always delivered
  - **Lack of resources online has led to frustration**
  - Many reported navigation / usability issues which affected their experience

*Students = 48 across all faculties
Bold = data relating to this faculty

mle evaluation results 07/08: MMUC

Vista Student Usage Summary 07/08[1]

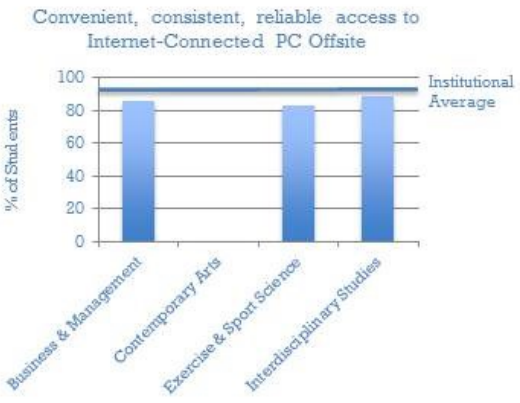
Department		Students in sample	Hits				Hits per student
			09:00-21:00	%	21:00-09:00	%	
Business & Management	F	218	111,408	76%	34,850	24%	671
	M	307	156,055	79%	40,424	21%	640
Contemporary Arts	F	7	1	1%	78	99%	11
	M	---	---	---	---	---	---
Exercise & Sport Science	F	198	181,926	86%	29,931	14%	1070
	M	467	339,053	83%	67,902	17%	871
Interdisciplinary Studies	F	465	212,102	84%	41,857	16%	546
	M	261	74,422	81%	17,132	19%	351

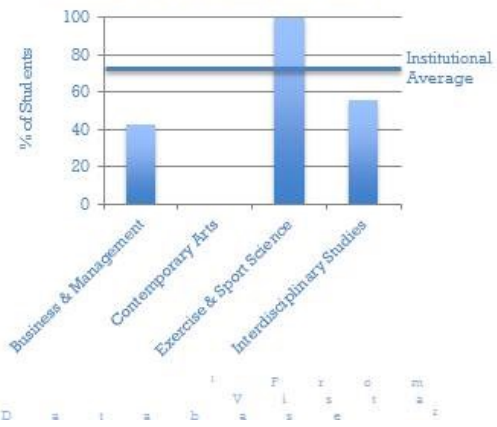


Student Attitudes Towards E-Learning & Vista 07/08[2]

Department	Students in Sample	Computing Confidence	E-Learning helps with learning	Vista improves student experience	Vista meets expectations
Business & Management	7	4.62	3.57	3.71	2.86
Contemporary Arts	---	---	---	---	---
Exercise & Sport Science	6	4.95	4.00	4.20	2.60
Interdisciplinary Studies	9	4.72	4.13	3.25	3.25
Institution AVG	385	4.75	4.14	3.63	3.35

*Rating Scale: 1(Strongly Disagree) to 5 (Strongly Agree)





From Vista Database

Student Focus Group Summary*: MMUC

- **Experience of E-Learning Systems**
  - Students generally happy with the concept of e-learning to support f2f teaching but not to replace it
  - **WebCT Vista was reported as a stand alone system or part of a combination of multiple e-learning systems in use within faculties coupled with** WebCT Campus, local intranets or **common drives**
  - **Generally, operating multiple systems did not cause students problems although managing multiple systems was reported as causing confusion with content location resulting in missed information**
  - Where no e-learning systems were in use, student did not perceive it as being important to them in their studies
  - **Where common drives were the primary e-learning tool, there was general dissatisfaction although students liked access to previous years' materials**
  - Greater contact with academics was reported where some form of online learning system was in use
  - **A lack of resources available online resulted in a lack of use by students**

- **Impact of use on learning / achievement**
  - **Where e-learning resources were made available the impact on learning / achievement was positive** especially when coupled with an active discussion forum.
  - When in use, students felt discussion forums assisted their learning due to interaction with other students and ability to look at others' questions / answers
  - Students liked the flexibility of accessing information 24/7 and felt it especially helped them when they were undertaking revision

- **Use of Web 2.0 technologies for e-learning i.e. facebook**
  - **The majority of students were happy to use Web 2.0 technologies with some evidence of facebook use as a staff2stu and stu2stu discussion tool.**
  - When in use, students reported facebook improved communication with staff. They felt they were more in touch with staff and it gave them a sense of 1-1 contact – "I can chat to him like a normal person"
  - Overall there was a reluctance to having academics as 'friends' in social online spaces although **there were pockets of support for this particularly where it was already happening**

- **Content Expectations**
  - **Students would like to see lecture materials** (prior to lecture), notices and links to external resources. Some also spoke of past exam papers, grades and timetable information.
  - **Nobody reported that their e-learning areas lived up to their expectation with very few modules giving access to this type of material.**

- **Consistency of Use**
  - **All reported a desire to see consistency of use with content**
  - **Nobody reported that consistency expectations were met.**

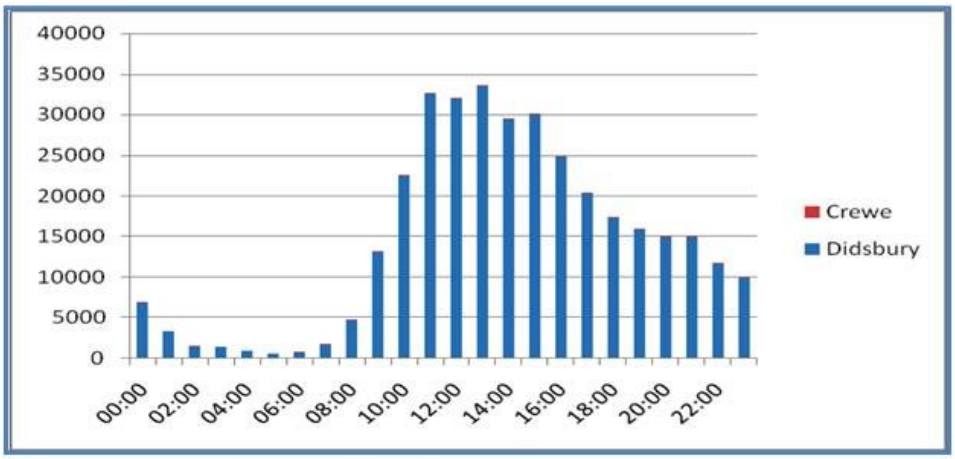
- **Student Experience**
  - **Some students were satisfied but many were not - satisfaction came from those students who used a single system.**
  - Students reported a positive impact on the students experience when it was used 'properly'
  - **Promised content was not always delivered**
  - Lack of resources online has led to frustration
  - Many reported navigation / usability issues which affected their experience

*Students = 48 across all faculties
Bold = data relating to this faculty

mle evaluation results 07/08: IoE

Vista Student Usage Summary 07/08[1]

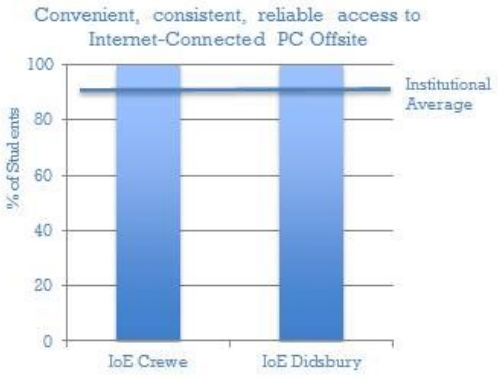
Department		Students in sample	Hits				Hits per student
			09:00-21:00	%	21:00-09:00	%	
IoE Crewe	F	295	102,519	85%	18,370	15%	410
	M	87	36,865	87%	5,381	13%	486
IoE Didsbury	F	202	1,164	87%	181	13%	7
	M	51	227	78%	65	22%	6

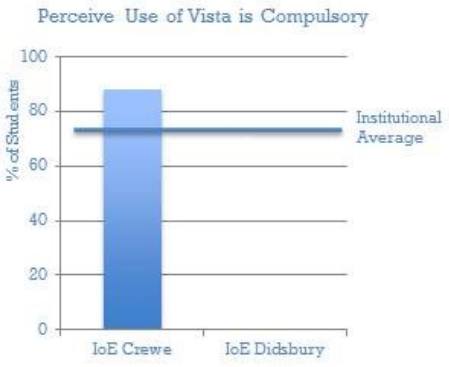


Student Attitudes Towards E-Learning & Vista 07/08[2]

Department	Students in Sample	*Computing Confidence	*E-Learning helps with learning	*Vista improves student experience	*Vista meets expectations
IoE Crewe	8	4.84	4.00	3.29	3.29
IoE Didsbury	1	5.00	---	---	---
Institution AVG	385	4.75	4.14	3.63	3.35

*Rating Scale: 1(Strongly Disagree) to 5 (Strongly Agree)





[1] From Vista Database [2] From Online Survey June 08 – August 08

Student Focus Group Summary*: IoE

- **Experience of E-Learning Systems**
  - **Students generally happy with the concept of e-learning to support f2f teaching** but not to replace it
  - WebCT Vista was reported as a stand alone system or part of a combination of multiple e-learning systems in use within faculties coupled with WebCT Campus, local intranets or common drives
  - Generally, operating multiple systems did not cause students problems although managing multiple systems was reported as causing confusion with content location
  - Where no e-learning systems were in use, student did not perceive it as being important to them in their studies
  - Where common drives were the primary e-learning tool there was general dissatisfaction although students liked access to previous years' materials
  - Greater contact with academics was reported where some form of online learning system was in use
  - **A lack of resources available online resulted in a lack of use by students**

- **Impact of use on learning / achievement**
  - Where e-learning resources were made available the impact on learning / achievement was positive especially when coupled with an active discussion forum.
  - When in use, students felt discussion forums assisted their learning due to interaction with other students and ability to look at others' questions / answers
  - **Students liked the flexibility of accessing information 24/7** and felt it especially helped them when they were undertaking revision

- **Use of Web 2.0 technologies for e-learning i.e. facebook**
  - **The majority of students were happy to use Web 2.0 technologies** with some evidence of facebook use as a staff2stu and stu2stu discussion tool.
  - When in use, students reported facebook improved communication with staff. They felt they were more in touch with staff and it gave them a sense of 1-1 contact – "I can chat to him like a normal person"
  - Overall there was a reluctance to having academics as 'friends' in social online spaces although there were pockets of support for this particularly where it was already happening

- **Content Expectations**
  - **Students would like to see lecture materials** (prior to lecture), notices and links to external resources. Some also spoke of past exam papers, grades and timetable information.
  - **Nobody reported that their e-learning areas lived up to their expectation with very few modules giving access to this type of material.**

- **Consistency of Use**
  - **All reported a desire to see consistency of use with content**
  - **Nobody reported that consistency expectations were met.**

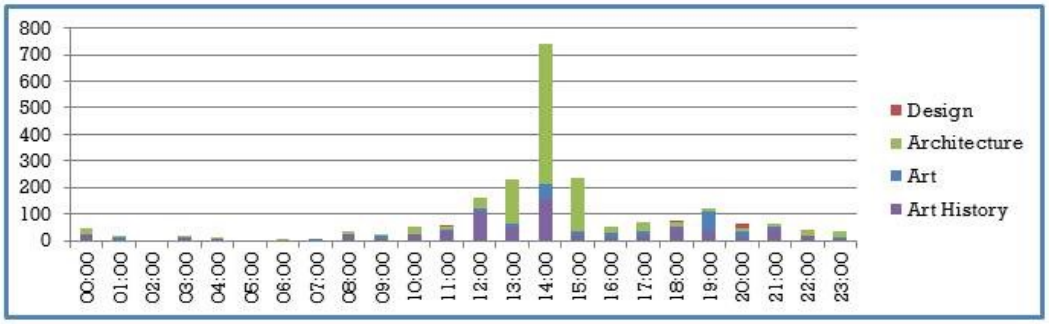
- **Student Experience**
  - Some students were satisfied but **many were not** - satisfaction came from those students who used a single system.
  - Students reported a positive impact on the students experience when it was used 'properly'
  - Promised content was not always delivered
  - **Lack of resources online has led to frustration**
  - Many reported navigation / usability issues which affected their experience

*Students = 48 across all faculties
Bold = data relating to this faculty

mle evaluation results 07/08: A&D

Vista Student Usage Summary 07/08[1]

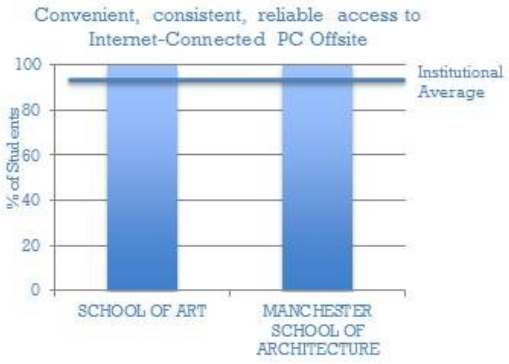
Department		Students in sample	Hits				Hits per student
			09:00-21:00	%	21:00-09:00	%	
School of Art	F	3	239	90%	27	10%	89
	M	1	1	33%	2	67%	3
School of Design	F	4	18	100%	0	0%	5
	M	2	7	100%	0	0%	4
School of Architecture	F	84	521	95%	28	5%	7
	M	82	547	88%	74	12%	8
History of Art & Design	F	4	92	97%	3	3%	24
	M	6	427	77%	128	23%	93

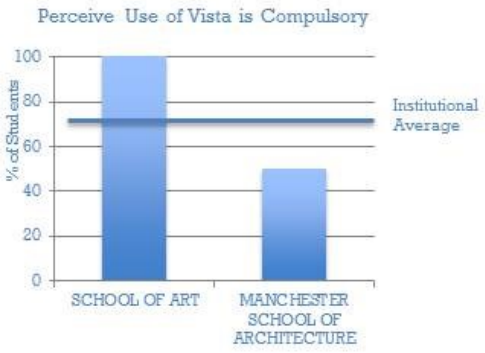


Student Attitudes Towards E-Learning & Vista 07/08[2]

Department	Students in Sample	*Computing Confidence	*E-Learning helps with learning	*Vista improves student experience	*Vista meets expectations
School Of Art	1	4.73	4.00	3.00	3.00
School of Design	---	---	---	---	---
Manchester School Of Architecture	4	4.52	3.75	3.25	3.25
History of Art & Design	---	---	---	---	---
Institution AVG	385	4.75	4.14	3.63	3.35

*Rating Scale: 1(Strongly Disagree) to 5 (Strongly Agree)





[1] From Vista Database [2] From Online Survey June 08 – August 08

Student Focus Group Summary*: A&D

- **Experience of E-Learning Systems i.e. WebCT Vista / WebCT Campus / Intranet / Common Drives**
  - Students generally happy with the concept of e-learning to support f2f teaching but not to replace it
  - WebCT Vista was reported as a stand alone system or part of a combination of multiple e-learning systems in use within faculties coupled with WebCT Campus, local intranets or common drives
  - Generally, operating multiple systems did not cause students problems although managing multiple systems was reported as causing confusion with content location
  - **Where no e-learning systems were in use, student did not perceive it as being important to them in their studies**
  - Where common drives were the primary e-learning tool there was general dissatisfaction although students liked access to previous years' materials
  - Greater contact with academics was reported where some form of online learning system was in use
  - A lack of resources available online resulted in a lack of use by students

- **Impact of use on learning / achievement**
  - Where e-learning resources were made available the impact on learning / achievement was positive especially when coupled with an active discussion forum.
  - When in use, students felt discussion forums assisted their learning due to interaction with other students and ability to look at others' questions / answers
  - Students liked the flexibility of accessing information 24/7 and felt it especially helped them when they were undertaking revision

- **Use of Web 2.0 technologies for e-learning i.e. facebook**
  - The majority of students were happy to use Web 2.0 technologies with some evidence of facebook use as a staff2stu and stu2stu discussion tool.
  - When in use, students reported facebook improved communication with staff. They felt they were more in touch with staff and it gave them a sense of 1-1 contact – "I can chat to him like a normal person"
  - Overall there was a reluctance to having academics as 'friends' in social online spaces although there were pockets of support for this particularly where it was already happening

- **Content Expectations**
  - Students would like to see lecture materials (prior to lecture), notices and links to external resources. Some also spoke of past exam papers, grades and timetable information.
  - Nobody reported that their e-learning areas lived up to their expectation with very few modules giving access to this type of material.

- **Consistency of Use**
  - All reported a desire to see consistency of use with content
  - Nobody reported that consistency expectations were met.

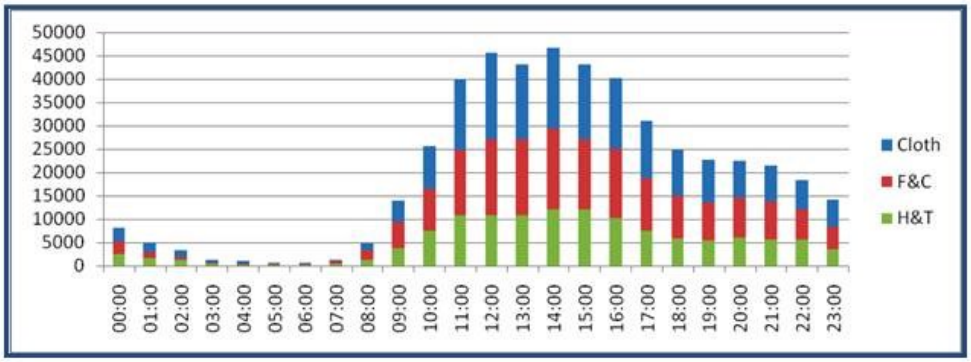
- **Student Experience**
  - Some students were satisfied but many were not - satisfaction came from those students who used a single system.
  - Students reported a positive impact on the students experience when it was used 'properly'
  - Promised content was not always delivered
  - Lack of resources online has led to frustration
  - Many reported navigation / usability issues which affected their experience

*Students = 48 across all faculties
Bold = data relating to this faculty

mle evaluation results 07/08: Hollings

Vista Student Usage Summary 07/08[1]

Department		Students in sample	Hits				Hits per student
			09:00-21:00	%	21:00-09:00	%	
Clothing	F	949	142,780	84%	26,987	16%	179
	M	67	8,223	74%	2,842	26%	165
Food & Consumer	F	233	108,630	85%	19,791	15%	550
	M	118	36,992	83%	7,812	17%	380
Hospitality & Tourism	F	356	68,770	81%	16,057	19%	238
	M	159	34,083	83%	6,884	17%	258

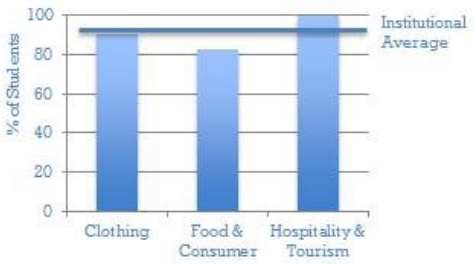


Student Attitudes Towards E-Learning & Vista 07/08[2]

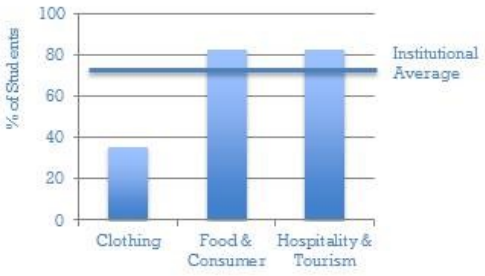
Department	Students in Sample	*Computing Confidence	*E-Learning helps with learning	*Vista improves student experience	*Vista meets expectations
Clothing	11	4.76	4.27	3.73	2.91
Food & Consumer	6	3.76	3.75	4.00	3.25
Hospitality & Tourism	6	4.54	4.50	3.67	3.17
Institution AVG	385	4.75	4.14	3.63	3.35

*Rating Scale: 1(Strongly Disagree) to 5 (Strongly Agree)

Convenient, consistent, reliable access to Internet-Connected PC Offsite



Perceive Use of Vista is Compulsory



[1] From Vista Database [2] From Online Survey June 08 – August 08

Student Focus Group Summary*: Hollings

- **Experience of E-Learning Systems**
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  - WebCT Vista was reported as a stand alone system or part of a combination of **multiple e-learning systems in use within faculties coupled with WebCT Campus**, local intranets or common drives
  - Generally, operating multiple systems did not cause students problems although **managing multiple systems was reported as causing confusion with content location**
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- **Impact of use on learning / achievement**
  - **Where e-learning resources were made available the impact on learning / achievement was positive** especially when coupled with an active discussion forum.
  - When in use, students felt discussion forums assisted their learning due to interaction with other students and ability to look at others' questions / answers
  - **Students liked the flexibility of accessing information 24/7 and felt it especially helped them when they were undertaking revision**

- **Use of Web 2.0 technologies for e-learning i.e. facebook**
  - **The majority of students were happy to use Web 2.0 technologies with some evidence of facebook use as a staff2stu and stu2stu discussion tool.**
  - When in use, students reported facebook improved communication with staff. They felt they were more in touch with staff and it gave them a sense of 1-1 contact – "I can chat to him like a normal person"
  - **Overall there was a reluctance to having academics as 'friends' in social online spaces** although there were pockets of support for this particularly where it was already happening

- **Content Expectations**
  - **Students would like to see lecture materials (prior to lecture)**, notices and links to external resources. Some also spoke of **past exam papers**, grades and **timetable information.**
  - **Nobody reported that their e-learning areas lived up to their expectation with very few modules giving access to this type of material.**

- **Consistency of Use**
  - **All reported a desire to see consistency of use with content**
  - **Nobody reported that consistency expectations were met.**

- **Student Experience**
  - Some students were satisfied but **many were not** - satisfaction came from those students who used a single system.
  - Students reported a positive impact on the students experience when it was used 'properly'
  - Promised content was not always delivered
  - Lack of resources online has led to frustration
  - **Many reported navigation / usability issues with Vista which affected their experience**

*Students = 48 across all faculties
Bold = data relating to this faculty